PAPER TRADE JOURNAL

VOL. 123, NO. 26 DECEMBER 26, 1946

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1947

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For a Prosperous New Year

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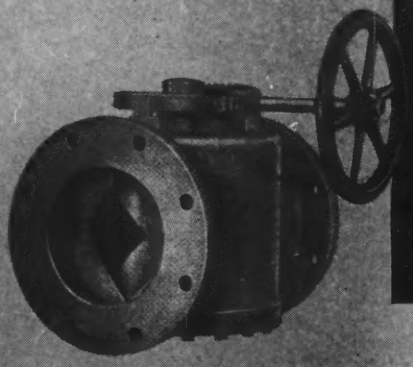
RSM

RAYCO LINTER COTTON

St. Regis Completes Purchase of Time Mills
Calder Declares 1947 Full of Promise
Appleton Sets Up Retirement Plan
Eaton Gives Christmas Bonus

Ontario Receives Briefs on Forestry Control
Congress Buys Paper for Third Quarter
Southland Aims at 200 Tons Daily
Albany Felt Buys Mill in Maine

PACKINGLESS
Stock Regulating Valves
Non-Plugging



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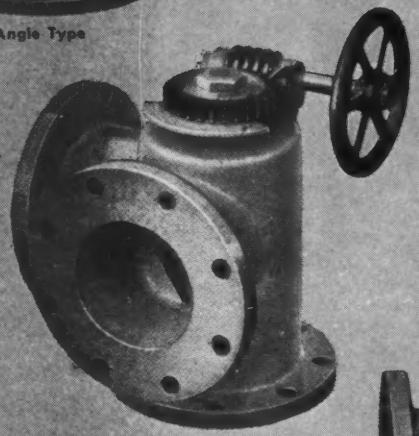

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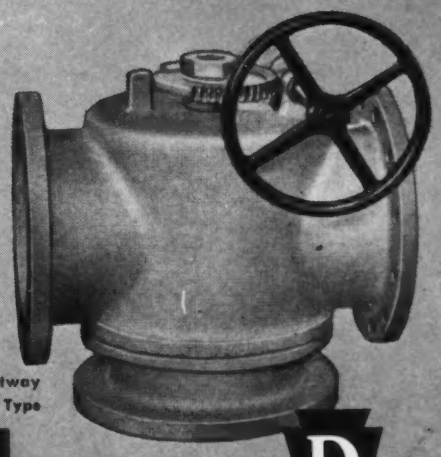

Straightway Outlet Type

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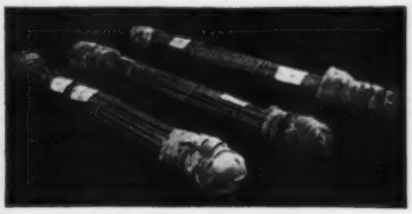
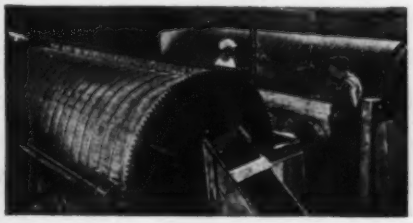
Paper Making Machinery

How to make your CYLINDERS and VACUUM DRUMS last longer

FOR STRENGTH AND RESISTANCE
to wear and corrosion, this typical paper machinery cylinder utilizes structural rods, wire cloth and winding wire of Monel. *Photo courtesy of Cosgrove Wire Cloth Co., Belleville, N. J.*



LEAVING THE ROLLING MILL.
A shipment of Monel structural rods for cylinder molds. These rods are stiffer and more corrosion-resistant than other non-ferrous materials used for this purpose.



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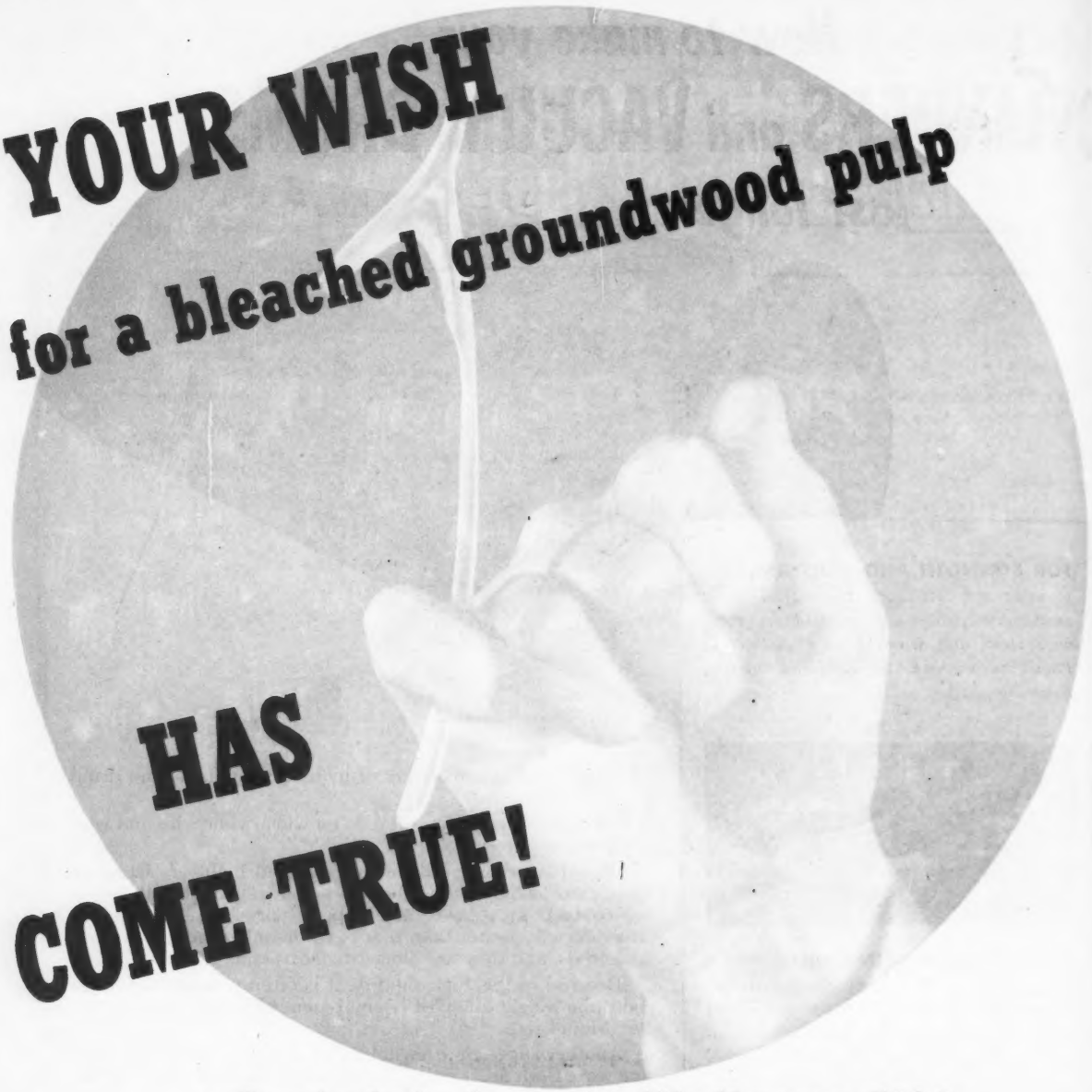
for a bleached groundwood pulp



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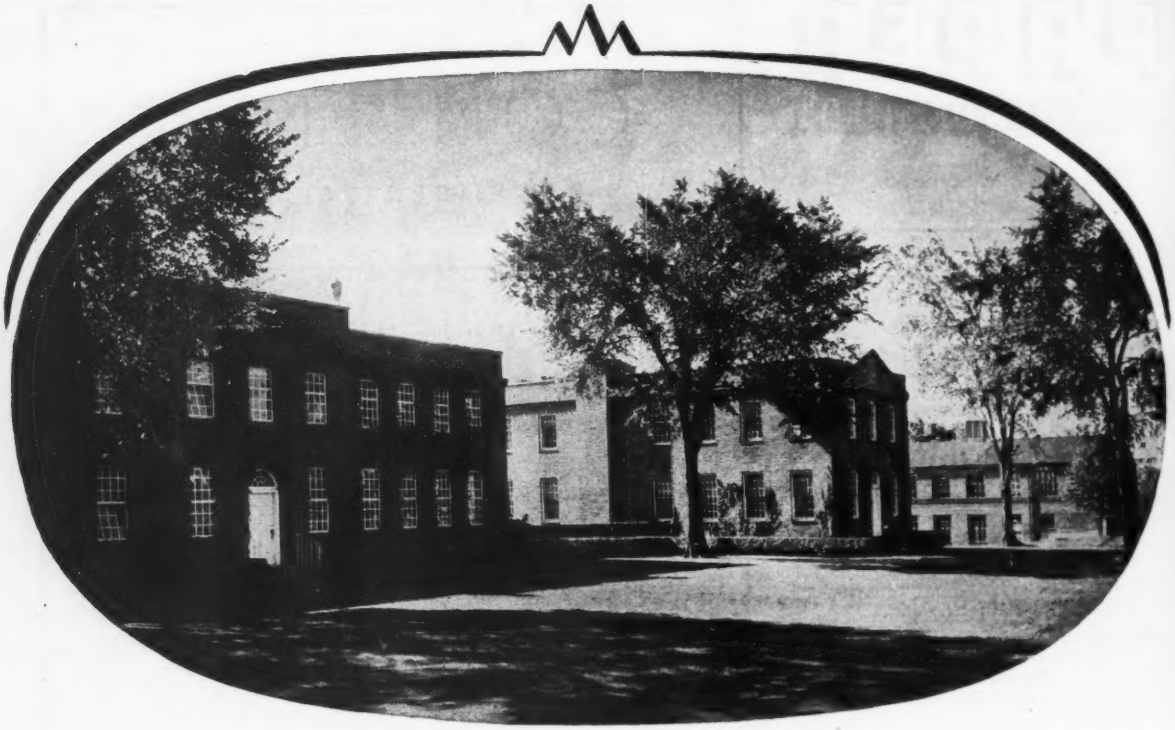

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230 Park Avenue, New York City

PAPER TRADE JOURNAL

Vol. 123, No. 26 December 26, 1946

Title Reg. U. S. Pat. Off.

Calder Finds 1947 Full of Promise

NEW YORK — Alexander Calder, president, Union Bag & Paper Corporation, declares that 1947 should be one of the best years the paper industry has ever experienced. The chief reason is that never before has demand exceeded the supply as it does today. The year ends with production in the industry over one million tons ahead of 1945 but still materially short of demand, and new uses for paper and paperboard indicate that this demand will continue to be heavy for at least another year.

Another strong reason for optimism is the fact that during the war there was no over-expansion in the paper industry. "I doubt," says Mr. Calder, "if there is any great danger from this source for years to come, first, because the demand is so great, and second, because construction costs today probably will prevent over-building. My guess is that fewer mills will be built in the next three years than the country needs to supply its requirements.

"As far as Scandinavian exports are concerned, I doubt that exports to the United States will be in sufficient quantity to meet our requirements for at least a year. To date, the shortage of fuel has kept the Swedish pulp industry down to approximately 55 percent of capacity, and pulpwood labor has been diverted, to some extent, to the cutting of wood for fuel. In fact, all industry in Sweden today, including the pulpwood industry, is on an allotment basis as far as wood consumption is concerned. Also, worldwide demand for Swedish pulp will materially affect the volume of Sweden's exports to the United States in the next few years.

"An actual shortage of pulpwood in Sweden will prevent that country from utilizing more than 85 percent of its pulp manufacturing capacity for the next 10 or 15 years, even after all restrictions on wood consumption have been removed.

"The removal of price ceilings in the industry has resulted in many modest and thoroughly justified increases in price. These increases are justified because of substantial increases in freight costs, wood costs, labor costs, and all raw material costs, to say nothing of the fact that the short supply in relation to the heavy

(Continued on page 18)

St. Regis Takes Over Time Mills; Adds 180,000 Tons To Capacity

NEW YORK—The St. Regis Paper Company last week completed the purchase of three paper mills from Time, Inc. According to Roy K. Ferguson, St. Regis president, this transaction will add 180,000 tons to St. Regis' annual output of printing, publication and converting papers, thus doubling its present production of these grades. With this added tonnage, this division of the company ranks equally with specification kraft paper in point of production.

By this purcase St. Regis acquired the Maine Seaboard Paper Company, at Bucksport, Me, the Hennepin Paper Company, Little Falls, Minn., and the Bryant Paper Company, Kalamazoo, Mich. The first two mills have been operated by St. Regis for almost a year under a managerial contract with Time, Inc., while Bryant has been managed under a similar contract since October 31, 1946.

Under the terms of the agreement, part of St. Regis' long-range expansion program, the company will issue to Time, Inc., 50,000 shares of its new 4.40 per cent first preferred stock and 550,000 shares of the common stock. The contract provides that an annual maximum of 85,000 tons of St. Regis publication paper will go under long-term contracts to Time, Inc. for the publication of magazines in its group.

St. Regis, now among the largest paper companies in the United States, will be enabled by the acquisition of these mills to produce 1,000 tons of printing, publication and converting paper daily. It is estimated that publication paper from St. Regis mills is used in the printing of magazines reaching a total circulation in excess of 30,000,000 people. In addition to strengthening the position of St. Regis in the field of publication papers, this purchase is expected to enhance its position in the merchant paper field. Plans now under way contemplate specialized production on several machines of new grades of top quality printing papers, both coated and uncoated which will shortly be available to the trade.

St. Regis production of shipping sack grade kraft paper and its conversion into multiwall paper bags con-

Atlas Tack Interests Buy Herkimer Mill

SPRINGFIELD, Mass. — The Atlas Tack Corporation, of Fairhaven, of which Sherman H. Bowles, publisher of the Springfield Newspapers, is president, has purchased two small manufacturing plants.

One plant is located in Herkimer, N. Y., and formerly was owned by the International Paper Co. The Atlas company may use the plant to make its own paper boxes.

Albany Felt Buys Maine Mill

COHOES, N. Y. — Further expansion of the paper industry in this section is noted with the purchase by the Albany Felt Company of a large mill building at Monmouth, Me., owned by the Nashua Manufacturing Company. The acquisition is to be used for production of papermakers felts and flannels. The new owners expect to take possession early in the coming year and facilities of the firm will be increased about thirty-five percent. Announcement was made that the water power rights are nearly sufficient to operate the new branch. A small branch plant was started at Hoosick Falls several months ago which has proven successful.

Henry J. Berger

Henry J. Berger, for thirty years editor of the Paper Trade Journal at the time of his retirement June 30, 1946, died on Christmas Eve at his home in Beacon, N. Y., where he had made his home with his brother. He was 74 years old, and those who saw him in New York only recently had commented on his improved appearance. A graduate of Dartmouth College, class of 1899, he had devoted nearly his entire life to the paper industry, and to the stationery trade. After a period in the newspaper field, he had become editor of the American Stationer in 1902. Leaving the organization which then published that paper and the Paper Trade Journal, he returned as editor of this magazine in June, 1916. His body was taken, on Friday, to his home city, Webster, Mass., for burial.

tinues to lead in this segment of the paper industry. Supplementing its kraft paper mills at Oswego, Carthage, Herring, and Watertown, N. Y., and East Pepperell, Mass., the company recently acquired the mill formerly owned by the Florida Pulp and Paper Company at Pensacola, and is proceeding, in conjunction with the Alabama Pulp and Paper Company in which St. Regis has an equity, with plans for additional paper-making equipment and a new multiwall paper bag plant at Pensacola. In addition, the company is planning installation of paper machine capacity at its large Tacoma pulp mill. Upon completing these mills, St. Regis will produce 355,000 tons annually of specification kraft paper, available for conversion into multiwall paper bags.

St. Regis also reported the signing of new long-term contracts with Weco Corporation, a subsidiary of Western Electric Company, to supply large tonnages of paper for the printing of telephone directories. In conjunction with this agreement, Weco is acquiring from Time, Inc. interests 300,000 shares of St. Regis common stock.

The contract specifies that St. Regis will furnish Western Electric Company with a minimum of 50,000 tons of printing paper in 1947, and provides for increases in annual tonnages to 76,000 tons maximum by 1950. Mr. Ferguson added that this arrangement expands St. Regis' long-term supply of specialty paper to Western Electric Company, whom is has served for many years. With the addition of the properties purchased from Time, St. Regis will produce the paper used in the printing of most of the telephone directories east of the Rocky Mountains.

This transaction concludes several months of negotiations between Time, Inc., and St. Regis for the purchase of the three mills acquired by Time during 1944 and 1945. Programs have been undertaken to modernize the properties and to improve the quality of the paper produced.

The mill at Maine Seaboard has three paper machines, two of 214-inch trim, and one of 80-inch trim; Hennepin, one machine of 111-inch trim, and Bryant, seven machines ranging in size from 112 inches to 152 inches.

Purchase of these properties brings to seven the number of mills at which St. Regis manufactures high-quality, light-weight, bleached and unbleached groundwood papers for national-circulation magazines, telephone directories, cattalogs, books and commercial forms. The other mills are located at Deferiet, N. Y., Harrisville, N. Y., Norfolk, N. Y., and Sartell, Minn., and have a combined capacity of 175,000 tons.

Developed by chemists of the E. I. duPont de Nemours & Co. (Inc.), in collaboration with St. Regis paper technicians, the sodium peroxide bleaching process for groundwood pulp has been adapted in St. Regis mills to the first large scale commercial production. The paper made from this sodium peroxide bleached pulp is now used in the printing of Fortune, Readers Digest, McCalls, Cosmopolitan, Parents Magazine, Popular Science, McGraw-Hill publications, Family Circle, Modern Screen, True Confessions, and many other magazines whose circulation totals many millions.

When combined with other pulps, bleached groundwood pulp using the duPont process can be converted into a wide variety of printing and specialty papers, combining good bulk, opacity, brightness, softness, and resilience.

St. Regis, founded in 1899, started manufacturing groundwood papers about 1920, when the market trend of the newsprint industry turned toward Canada. The company now manufactures, at its 29 pulp and paper mills and converting plants in the United States, Canada, and overseas, a wide range of wood cellulose products, including kraft paper, kraft pulp, multiwall paper bags, bag-making and bag-filling machinery, and Panelyte plastic, a structural laminated product using as one of its bases kraft paper produced at St. Regis mills.

Better Feeling Pervades Midwest Paper Market

CHICAGO—The paper trade evidenced more optimism during the past week than it has for several months past. Grave concern continued over the inability of the trade to meet insistent demands for more and more paper but the avoidance of the freight embargo with what would have been most serious consequences, served to add a buoyant note so lacking for the past few weeks. Prices, too, were reported to have assumed some basis of consistency following advances of past weeks, although buyers were in no way hesitant to place orders regardless of price. It was noticeable here that the trade preferred the future good will of customers and a marked desire to do its part to avoid inflationary spirals, by certainly not taking advantage of its position.

Marketwise, reports indicated a continued real shortage in mimeo and government papers and a huge demand for printing papers which were being asked for by the general trade. Locally, the wrapping paper situation was acute as retail outlets used all war conservation measures to conserve the short supply. The waste paper market was little changed over last week with prices reported fairly firm.

Oneida Moves to Clifton Without Production Loss

CLIFTON, N. J.—Oneida Paper Products, Inc., has completed removal from its New York offices and plant to its new home at 10 Clifton Boulevard. The new telephone number is Passaic 3-5600. The New York trade can call Enterprise 6293 and avoid toll charges. The entire job of moving its offices and over 100 operating units to its new plant was accomplished without any production loss.

Bowater's Financing Looks to Enlarged Newsprint Output

TORONTO—A new financing and refunding issue of $6,683,500 three and one half per cent first mortgage, series of 1947 bonds of Bowater's Newfoundland Pulp and Paper Mills, Limited, is expected to be offered to the public shortly at 101 by Royal Securities Corp., Ltd. Proceeds of the new issue, which is dated January 1, 1947, maturing January 1, 1948, will be used to retire on January 10, 1947, the presently outstanding $2,395,500 four per cent series of 1945 bonds; provide $3,492,577 for capital expenditures already made, and to provide $795,423 working capital in respect of a fifth paper machine already installed.

Total annual interest charges on first mortgage bonds will amount to $496,423, against which earnings for the year ended September 30, after depreciation and depletion, are reported at $2,661,130.

Expansion plans, reportedly under way and scheduled for completion in 1948, will increase plant capacity, it is stated, to approximately 940 tons of newsprint and 175 tons of export sulphite per day making the company' newsprint mill at Corner Brook, Newfoundland, the largest in the world.

North Carolina Utilities Gets Pulp Mills Protests

RALEIGH, N. C. — Pulpwood and paper mills in the state are showing prompt opposition to the railroads' application for increased intrastate freight rates, according to H. M. Nicholson, traffic division chief of the North Carolina Utilities Commission. Mr. Nicholson said he has received letters and telegrams from most of the firms, all asking that the commission conduct a separate hearing on rates for pulp wood and paper.

Up to now, however, he added, "I have had only slight response from other North Carolina shippers."

He explained that most shippers, both industrial and commercial, had their say on the issue when the Interstate Commerce Commission conducted a series of regional hearings on the railroads' requests.

One reason for the action of the paper and pulp mills, it was intimated, may be that the mill operators want to standardize the complicated and different levels of rates now in effect in the various states.

Cohoes Envelope Increases Staff

COHOES, N. Y. — Cohoes Envelope Company, Inc., has been enlarging its force on an extensive scale during the past few weeks. Recent increases have brought the wage scale up to 85 cents per hour and the labor agreement affords employes two weeks of vacation with pay and a liberal pension plan. The mill is running with day and night shifts in all departments.

Nat'l Folding Box Elects W. D. Lynch

NEW HAVEN, Conn.—Walton D. Lynch, New York, last week was elected president of the National Folding Box Company, Inc. At the same time stockholders of the National Folding Box Company, a New Jersey corporation, had approved its acquisition by the National Folding Box Company, Inc., a new Connecticut corporation. George W. Mabee is retiring president of the older company.

Lynch started with the National Folding Box Company in 1919 on his release from military service at the close of World War I. Since 1938 when he was elected vice-president in charge of sales and advertising, he has served as president of the Folding Paper Box Association and last month concluded his second term as president of the Packaging Institute. During World War II he served on the War Production Board and the industry O.P.A. Advisory Committee. He was recently cited for his efforts during the last war by the armed forces for his work in connection with the development of American War Standards in the packaging field.

The National Folding Box Company, oldest folding paper box manufacturer in the American packaging industry, is the result of a consolidation effected in 1891 of eight New York and New England companies. In the paper packaging field it was the first company to perfect set-up paper boxes from carton blanks, a packaging technique now licensed to leading bakery, dairy, and confectionery manufacturers. The company also pioneered the first hinged hosiery boxes, the first lithographed blanket boxes, as well as the first paper ice-cream pails and the "fiat fifty" cartons for cigarettes. Volume of each of these items is now measured in millions of wants. Recently, it announced a new, machine loaded "carry-out" for the soft drink beverage field.

In the merger of National Folding Box Company with the new Connecticut corporation, capitalization was increased from $3,000,000 to $5,000,000. The company has no funded debt.

San-Nap-Pak Reported as Mt. Tom Purchaser

HOLYOKE, Mass.—The San-Nap-Pak Manufacturing Company of Wheelwright is reported here as the buyer of the Mount Tom Sulphite Company at Mount Tom Junction, the oldest sulphite pulp mill in the nation.

The deal went through last week. However, officials of the Mount Tom concern and the San-Nap-Pak firm could not be reached for confirmation. Arthur D. Showalter, general manager of the pulp mill, left word at his office that an official announcement will be made early next week, possibly Monday.

San - Nap - Pak, makers of sanitary napkins and facial tissue, plan to build a paper manufacturing plant there. If this develops, it will be the first new paper mill in the Holyoke area since the turn of the century.

It was reliably reported in Holyoke paper manufacturing circles last week that San-Nap-Pak had the inside track of the five bidders. This sale is of great significance to the New England paper industry as it will withdraw a substantial source of pulp. The new owners will use most of the output for its own needs. The Chemical Paper Manufacturing Company and American Tissue Mills of this city are among the present customers of the Mount Tom plant.

Southland Output Scheduled To Jump 200 Tons Daily

WATERTOWN, N. Y.—A new modern 234-inch paper machine for the manufacture of newsprint is being built by the Bagley & Sewall Company here for the Southland Papermills of Lufkin, Texas, the only mill in the United States that is now manufacturing newsprint from Southern pine. The paper machine will increase the output of the Texas mill 200 tons of newsprint daily, according to John H. O'Connell of Washington, D. C., consulting engineer for the Southland Papermills.

Mr. O'Connell, who was formerly president and general manager of the Diana Paper Mill at Harrisville, said that the Southland mill already is manufacturing 178 tons of newsprint daily and it has proved most satisfactory. He said that besides the newsprint, the mill is manufacturing 85 tons of high grade kraft board.

The outlook for the manufacture of newsprint in the south from long and short leaf southern pine is extremely bright, according to Mr. O'Connell. He said that Southland is considering the possibility of further expansion.

Packaging Engineers to Meet April 29 in Chicago

CHICAGO—The Industrial Packaging Engineers Association has set the date for its annual exposition, slated for April 29 to May 1 inclusive, in Chicago. Included among the many features will be a Protective Packaging Contest with I. J. Stoller, vice-president of Bradner-Smith & Company, Chicago paper merchants, as chairman.

Bancroft Mill Electrified

BECKET, Mass.—The Bancroft Mill, owned by the Golden Fleece Co., has just completed casting aside its steam power, and has gone entirely electrical. The electrification of the mill was a major project which started nearly a year ago, and resulted in the installation of new machine drives which reduced power costs and increased production about 20 percent.

Indiana Is Hopeful For the New Year

INDIANAPOLIS, Ind. — While paper shortages still exist through a number of causes, there is a spirit of optimism in the trade which augurs well for the coming year. Right now most of the trade is preparing for the annual inventory period. Stocks carried over into the new year will be very light as compared with some other non-war years. Demand for most lines continued heavy last week. There continued to be difficulty with shipments because of car shortages, but it is believed that after the first of the year, unless there is exceptionally bad weather, this situation will solve itself. The trade got through the mine strike in fair shape. None of the factories were compelled to shut down in Indiana, but some of them were getting close to the deadline.

The labor situation does not appear to be much improved. The turnover continues to be high.

Newsprint continued to be a fly in the ointment. Indiana publishers are getting rationed just the same as everybody else and the receipts are not nearly what is desired. There is talk that advertising rates must go up because of high newsprint prices. Advertising continues to be turned down, but lineage is slightly ahead of that of a year ago.

The first quarter promises to be a heavy one for the fine paper market. Contracts for school books, public printing and a lot of indirect mail matter are being awarded and successful printers are bombarding the trade for figures and possible supplies.

It is believed that by spring the jobbers of building paper and roofing will have good supplies on hand, sufficient to take care of what likely will be a much better year than the one passing.

Rag demand continued steady last week with white cuttings very active. Waste paper was much in demand. Local collections have fallen down during the holiday season and there are light stocks in the local warehouses. Much of the demand is for better grades, but jobbers are having no difficulty in disposing of the more common grades.

Lists Paper Firms Among Old Timers

CHICAGO — The Chicago Association of Commerce has recently published a list and specially honored all Chicago pioneer business organizations which established their businesses prior to the Chicago Fire in 1871. Included in the list were some well known Chicago paper firms including the Hanchett Paper Company (1871); J. W. Butler Paper Company (1844); Bradner Smith & Company (1852); Union Bag and Paper Corporation (1866); and the Messinger Paper Company (1865).

Appleton Adopts Retirement Plan

APPLETON, Wis. — Establishment of a retirement pension plan for hourly paid employes at the Appleton Coated Paper Company was revealed Wednesday evening, December 11, at an organization meeting of the Quarter Century club of the firm at the Conway hotel as veterans of the company were honored for their many years of service.

Fred C. Heinritz, president of the company and principal speaker of the evening, explained that the pension plan is designed to supplement the benefits offered by social security. "The plan will benefit and reward those employes who have been with the firm for a substantial part of their lives and who would retire voluntarily due to age or poor health," he said.

The president paid tribute to each of the twenty-five employes honored and presented each charter member of the club with a gold wrist watch and an especially designed Quarter Century club pin. They are Charles S. Boyd, Matt D. Weyenberg, Fred C. Heinritz, Earl A. Helser, Edward W. Peotter, Anton C. Gauerke, Edward A. Muenster, Delbert J. Chady, Henry J. Ashman, Lester Helser, Florian Zeffery, Herman B. Berge, Louis W. Thies, Richard A. Wheeler, Ethel Denstedt, Lloyd W. Smith, George G. Sylvester, John B. Moll, Earl B. Rogers, Frank E. Sanders, John H. Otto, Theodore A. Lang, Fred G. Kubitz, William Farquhar, Sr., and Gus T. Moll. Earlier in the year Cora F. Koletzke, Frank Nowak and Elmer E. Koerner received similar awards.

Matt D. Weyenberg was elected president of the newly organized club as charter members, their wives and company officials gathered for the dinner and meeting. Charles S. Boyd, who founded the company May 7, 1907, was named honorary president. Elected to other offices for terms during 1947 were Elmer E. Koerner, vice-president; and Cora F. Koletzke, secretary-treasurer.

Paper Merchants Sets Up Insurance-Retirement Plan

PHILADELPHIA — A three-point security and financial benefit program for the men and women of Paper Merchants, Inc., and the Fera Zavelle Company Division of the organization, was made public late last week. Winfield Predmore, president of the Paper Merchants Company, told the details at a Christmas party for members of both organizations in the Ritz-Carlton Hotel.

"Effective as of today," said Mr. Predmore, "everybody who works for Paper Merchants, Inc., and Fera Zavolle Company, will receive, without cost to themselves, free group life insurance, and free hospitalization for not only themselves but their dependents. The entire cost is being borne by the company.

"In addition, those who have been with the company for five years are eligible for our retirement, and profit-sharing plan, whereby certain sums are placed to their credit year by year, by the company, to be paid upon their retirement, or, in paid-up value, if they should leave the organization.

"It is my sincere hope that the inauguration of such a plan as this will indicate that Paper Merchants is launching a wide-spread campaign for greater sales, on a wider basis, with considerable expansion planned in the years ahead."

Mr. Predmore said that the decision to make the benefits available to employees, now, was decided upon by unanimous action of the board of directors and upon request of the stockholders.

Referee Ryan Awards Disputed Wages to Three

HOLYOKE, Mass.—Three employes of the Chemical Paper Manufacturing Co. have been awarded disputed wages for last Fourth of July in an opinion handed down by Arthur Ryan, business manager of the Holyoke Transcript-Telegram, who acted as an umpire in the dispute.

The choice of Mr. Ryan as umpire was agreed upon by the company and the papermaking labor unions in compliance with a clause in their contract which specifies such umpiring as a fifth step in settlement of disputes not otherwise settled.

Mr. Ryan held a hearing at the company offices at which Edward M. Moore, Andrew Beaton and Robert Cameron represented the labor unions and Joseph E. Holmes, E. S. Tucker and C. Y. Tayber represented the company.

The agreement specifies that a man must work on "his scheduled work day immediately preceding and immediately following such holiday" in order to get holiday pay.

The mill was shut down the week of July Fourth but a notice was posted indicating that the employes not eligible for vacation pay would be provided with work and were asked to arrange for such work with the superintendent. The three employes took the week off.

The company refused to pay them, contending that the "scheduled work days" were the day before and the day after the holiday. The unions contended that the "scheduled work days" involved were the day before and the day after the shut-down week.

Mr. Ryan found that there was more merit in the workers' contention than in the company's and ruled accordingly. Both sides had agreed in advance to accept the ruling of the umpire.

In the course of his opinion on the case, Mr. Ryan remarked that "this agreement represents what must be one of the most effective and best-worked-out in detail agreements between labor and management anywhere."

Eaton Distributes Wage Dividend

PITTSFIELD, Mass. — For the sixth consecutive year, the large majority of Eaton Paper Corporation employes will receive a wage dividend, it was reported last week by George P. Clayson, president. Six hundred ninety-eight of the 731 on the pay roll as of the first of the month will share in the distribution of $68,000. Last year a total of $55,000 was paid to 625.

As in the past, payment is based on service. Employes with more than 15 years will get four weeks' wages. The remainder of the schedule is as follows: 5 to 10 years, two weeks; three to five years, one and one-half weeks; one to three years, one week; six months to one year, one-half week; less than six months, one-quarter week.

The working force is up 79 from the 652 on the pay roll a year ago.

In announcing the dividend, Clayson told the employes, in part, "It is more than just a distribution of so many dollars and cents. It is a dividend on your performance based on your length of loyal service with Eaton. By increasing hourly average rates during the year, by better production you have had a hand in reflecting these in your wage dividend. In other words, you've had a big share in determining how much you receive as a dividend.

"But beyond this, it means that you have produced, by working honestly and hard, to make the dividend possible. It is a symbol of a successful year, made possible by your splendid work. That is why the wage dividend means so much. It is the surest indication that you have responded to a challenge, and have met it. When you do that, we can declare a wage dividend."

Kimberly Foremen Hear About Postwar Duties

KIMBERLY, Wis. — A. A. Nicholson, World War I veteran and assistant to the vice-president of the Texas Company, addressed the Kimberly mill Foremen's club, of Kimberly-Clark Corporation at its dinner meeting Monday evening, December 16, at the Kimberly clubhouse. His subject was "The Postwar Foreman."

Badger-Globe Foremen Elect Miller President

NEENAH, Wis.—Edward Miller was elected president of the Badger-Globe Foremen's club at a dinner meeting Monday evening, December 9, in the Valley Inn. Robert Mott was elected vice-president; C. O. Holverson, secretary; R. E. Loffren, treasurer; John Resba, board member for two years, and Carl Reichel, board member for one year.

DIAMOND AUTOMATIC PROCESS CONTROL KEEPS PRODUCTION "ON THE BEAM"

Typical of instruments used in Diamond Automatic Process Control is this continuous analyzer in the Chlorine Plant.

Sentinels that never sleep watch every step of Diamond Alkali's manufacturing processes, protecting the uniformity and quality of Diamond products.

Many processes are conducted in tanks, towers or kilns where there is little opportunity for periodic sampling or visual inspection. But the probing, sensitive "fingers" of indicating or recording instruments reveal important facts as to conditions within.

With this data Diamond operators carefully watch and control the development of each process thus insuring the high quality of the finished product

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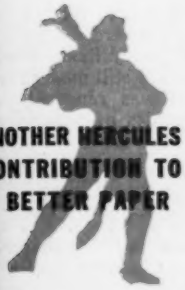
THE INSIDE STORY

IT PAYS TO KNOW *MORE* ABOUT

HERCULES

Y OF SIZE



Hercules can help keep products *inside* your containers with a complete line of wax rosin sizes and wax emulsions. Hercules Paracols* (wax emulsions) and plasticized dry rosin sizes form a group of sizing agents which impart the high degree of water resistance required in containers such as milk and ice cream cartons, paper cups, frozen food containers, coasters, butchers' papers, and wrappings for moisture-laden foods.

Paracols added at the beater, applied at the size press, or the calender stack, improve finish and reduce curl, as well as contribute to water resistance. Because of their wide range of properties, these Hercules products permit virtually tailor-made selection for almost any wax sizing need.

Write for details on these and other Hercules sizes and papermakers' chemical materials.

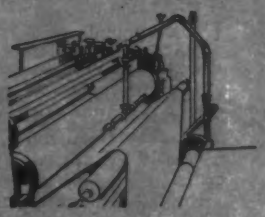
*Reg. U. S. Pat. Off. by Hercules Powder Company

Hercules chemical materials for the paper industry include:

Staybelite* Esters...
Wax additives for coating and laminating processes, modifiers for GRS and Neoprene latices for impregnating and laminating paper and board stocks.

Hercolyn*...
A liquid resin for transparentizing. Possessing excellent fiber-wetting properties, it is useful for the production of transparent and translucent papers.

Chemical Cotton...
Hercules chemical cotton is a pure cellulose, in loose or sheet form. Cleanliness and brightness are outstanding.



Casein...
Hercules casein is used as the binder in clay-coatings, and as an adhesive in laminants and paper converting.

Paracols*...
Water-dispersible wax emulsions used to increase finish, flexibility, printability, and waterproofing of paper.

Chemicals...
These include sulphonated oils, foam killers, eveners, acids, alkalies, alum and satin white.

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INCORPORATED
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CHEMICAL MATERIALS FOR THE PAPER INDUSTRY

Congress Buys Paper For First Quarter

WASHINGTON — Awards were made public Monday by the Joint Congressional Committee on Printing for paper for use of the Government Printing Office for the three months period beginning January 1, 1947. Bids for the paper were received on December 16. The awards indexed according to items as numbered in the PAPER TRADE JOURNAL for December 19, follow:

No. 2—Bermingham & Prosser Co., 7.60 cents (100,000 pounds).

No. 3—Barton, Duer & Koch Paper Co., 9.87 cents (200,000 pounds).

No. 5—Mead Sales Co., 9.88 cents (250,000 pounds).

No. 7—Mudge Paper Co., 8.76 cents (50,000 pounds).

No. 8—Mudge Paper Co., 8.76 cents.

No. 9—Mudge Paper Co., 8.76 cents (160,000 pounds); Mead Sales Co., 9.03 cents (190,000 pounds).

No. 10—Mead Sales Co., 8.58 cents.

No. 19—Mudge Paper Co., 11.18 cents.

No. 20—Mudge Paper Co., 9.81 cents (300,000 pounds); Franklin Research Co., 11.30 cents (500,000 pounds).

No. 22—Mead Sales Co., 8.83 cents.

No. 33—Mudge Paper Co., 9.39 cents (300,000 pounds).

No. 34—R. P. Andrews Paper Co., 8.08 (400,000 pounds).

No. 37—Barton, Duer & Koch Paper Co., 10.22 cents (300,000 pounds).

No. 38—Barton, Duer & Koch Paper Co., 9.51 cents (100,000 pounds).

No. 40—Consolidated Water Power & Paper Co., 9.523 cents per pound.

No. 45—R. P. Andrews Paper Co., 8.15 cents (400,000 pounds).

No. 48—Eastern Corp., 11.79 cents.

No. 49—Eastern Corp., 12.51 cents.

No. 50—D. L. Ward Co., 15.49 cents (50,000 pounds).

No. 52—D. L. Ward Co., 14.14 cents.

No. 53—D. L. Ward Co., 11.49 cents (600,000 pounds); Cauthorne Paper Co., price prevailing at time of shipment (200,000); R. P. Andrews Paper Co., 9.02 cents (700,000 pounds).

No. 55—R. P. Andrew Paper Co., 8.00 cents (500,000 pounds).

No. 56—R. P. Andrews Paper Co., 7.42 cents (200,000 pounds).

No. 59—Mead Sales Co., 9.94 cents.

No. 61—Eastern Corp., 11.06 cents.

No. 64—Franklin Research Co., 20.55 cents.

No. 71—Graham Paper Co., 15 cents.

No. 73—Graham Paper Co., 16 cents.

No. 76—Old Dominion Paper Co., 27.988 cents (20,000 pounds); Paper Corp. of U. S., 29 cents (20,000).

No. 78—Old Dominion Paper Co., 28.738 cents (20,000 pounds).

No. 85—Barton, Duer & Koch, 32 cents (60,000 pounds); R. P. Andrews Paper Co., 32 cents (20,000 pounds).

No. 102—Eastern Corporation, 10.82 cents.

No. 106—Barton, Duer & Koch Paper Co., 16.64 cents (150,000 pounds); Howard Paper Mills, Inc., 16.64 cents (200,000 pounds).

No. 107—Wilcox-Walter-Furlong Paper Co., 17.15 cents (50,000 pounds); Central Ohio Paper Co., 17.15 cents (50,000 pounds); R. P. Andrews Paper Co. (50,000 pounds); Howard Paper Mills, 16.64 (200,000 pounds).

No. 108—Franklin Research Co., 18.45 cents (50,000 pounds); Howard Paper Mills, 16.64 cents (200,000 pounds); Whitaker Paper Co., 17.15 cents (50,000 pounds).

No. 109—Franklin Research Co., 17.55 cents (450,000 pounds); Howard Paper Mills, 15.67 cents (50,000 pounds).

No. 113—Howard Paper Mills, 17.36 (400,000 pounds).

No. 114—Howard Paper Mills, 16.39 cents.

No. 153—Eastern Corporation, 11.79 cents.

No. 176—Barton, Duer & Koch Paper Co., 31 cents.

No. 177—Barton, Duer & Koch Paper Co., 31 cents.

No. 185—Barton, Duer & Koch Paper Co., 12.95 cents.

No. 190—Barton, Duer & Koch Paper Co., 19.15 cents.

No. 191—Barton, Duer & Koch Paper Co., 19.90 cents (200,000 pounds).

No. 196—Barton, Duer & Koch Paper Co., 30.50 cents.

No. 203—Whitaker Paper Co., 10.71 cents.

No. 208—Frank Parsons Paper Co., 8.00 cents.

No. 209—Bulkley, Dunton & Co., Inc., 6.30 cents.

No. 219—Old Dominion Paper Co., 6.694 cents.

No. 254—Cauthorne Paper Co., Inc., 15.40 cents.

No. 265—Mudge Paper Co., 11.10 cents.

No. 271—Paper Corp. of U. S., 12.25 cents.

No. 280—Mudge Paper Co., 11.80 cents.

No. 301—Old Dominion Paper Co., $46.968 per 1,000 sheets and $47.068 per 1,000 sheets.

No. 305—Old Dominion Paper Co., $83.328 per 1,000 sheets and $83.12 per 1,000 sheets.

No. 310—R. P. Andrews Paper Co., 11.42 cents.

No. 325—R. P. Andrews Paper Co., 6.95 cents (2,000,000 pounds); Whitaker Paper Co., 7.67 cents (2,000,000 pounds).

No. 326—R. P. Andrews Paper Co., 6.95 cents (2,000,000 pounds); Whitaker Paper Co., 7.67 cents (2,000,000 pounds).

No. 327—R. P. Andrews Paper Co., 6.95 cents (2,000,000 pounds); Whitaker Paper Co., 7.67 cents (2,000,000 pounds).

No. 360—Mudge Paper Co., 4.025 cents (75,000 pounds).

No. 368—Consolidated Paper Co., 7.65 cents.

Midwest Prices Hold To Firm Levels

CHICAGO—The Chicago paper trade reported this week that prices were firm and were, in general, being held at the levels which followed the removal of the OPA ceilings. The initial spurt, obviously covering the marked squeeze which many lines were suffering under, raised the prices to make paper making and distributing at least profitable and then, according to reports, formed a firm level which lets the trade know where it stands.

All lines are in heavy demand with the shortage condition still most prevalent. However, it was reported that more and more grades of paper were entering the market.

An advance in mill prices of waste paper was reported, an advance which brought quotations up to $30 a ton for No. 1 new and of $31 for No. 1 old corrugated. Sources indicate that No. 1 mixed papers are holding steady at $19 a ton. The increases quoted were reported not to come as a surprise but merely reflected seasonal conditions which made collections more difficult. Current waste paper receipts are reported good and adequately reflecting the results of the Christmas shopping rush which has presented Chicago's State Street with just about the biggest Christmas from standpoint of dollar volume and sales in the history of the street.

Westvaco Elects Cook To Directorate

NEW YORK — Theodore A. Cook, manager of the Charleston, S. C., plant of West Virginia Pulp and Paper Company, was elected to the board of directors of the company at a meeting held in the New York offices.

Mr. Cook has been manager at Charleston since construction of the plant was begun in 1936 and has served with the company for 37 years. He began as a chemist following his graduation from Pennsylvania State College in 1909 and was superintendent of the pulp mill at the Tyrone, Pa., plant when he was appointed manager of the Charleston plant.

Mr. Cook was elected to the board to fill a vacancy created by the recent resignation of Edwin S. Hooker.

Gilbert Entertains Kiwanis

NEENAH, Wis. — Members of the Neenah Kiwanis club were guests of the Gilbert Paper Company at luncheon at its new cafeteria Wednesday, December 11. Later they were taken on a tour of the mill.

N. C. Pulp Names Collins

PLYMOUTH, N. C. — Woodrow R. Collins was appointed purchasing agent of the North Carolina Pulp Company, effective December 16.

OLIVERS... at KVP

This is the mill making the headlines right now in Canada and the States. It's a community rehabilitation job and mill construction project of the first order, carried out with great thoroughness and attention to detail. It's significant that in planning the new and up-to-date sulphate mill, Oliver Ringvalves were selected for the pulp washing filters.

Perhaps the most interesting part of this diversified filter installation is the set-up of the four Ringvalve Filters, each equipped to separate strong and weak wash liquor. It consists of two lines, each with two filters in series washing counter-currently. The weakest wash liquor works its way back to the head of the line, becoming stronger with each step. Used finally as the first wash on the primary filter, it emerges as strong liquor going to the evaporators.

All of the Oliver United Filters mentioned above together with Oliver Bleach Washers, High Density Thickeners and Board Forming Machines are so well-engineered and so adaptable to pulp and paper mill operations that every company requiring filters should give these filters every consideration . . . as did the authorities at KVP.

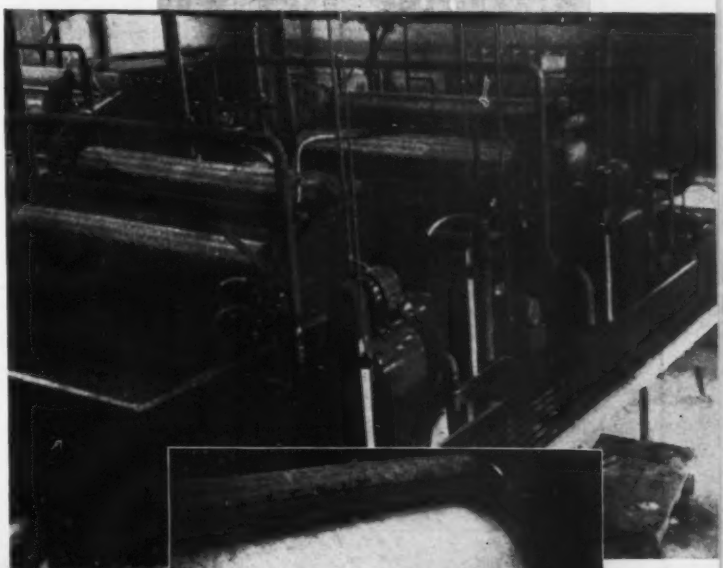
four Ringvalve Brown Stock Washers

two Vacuum Savealls

one Lime Mud Filter

and two Dorrco Salt Filters

(The Dorrcos All Nickel Construction)



OLIVER UNITED FILTERS INC.

"Pulp Quality Raised";

"OUR STREAMBARKER IS AVERAGING 9½ CORDS PER HOUR" BELOW, COMPARE RESULTS AT 11 OTHER MILLS!

MILLS MAKING HIGH-GRADE PAPER are quick to appraise the value of any new equipment which can maintain a cleaner woodroom operation and thus lead to higher pulp quality.

This cleanliness of process, along with other important savings in wood, extra operations and machines, is the primary purpose of the modern Allis-Chalmers Streambarker hydraulic log barker.

Pictured here in operation at one of the nation's leading mills producing high-grade book and magazine papers, Streambarker is barking an average of 9½ cords of Spruce, Hemlock, etc. an hour. Logs are taken from a hot pond, are barked and conveyed directly to chippers or to storage—with minimum recirculation. The standard of performance established at this mill has led to the recent installation of an additional Streambarker in another of the company's mills.

For a complete explanation of Streambarker operation, plus a handy form which enables you to accurately estimate savings Streambarker can effect in your mill, get in touch with the experienced representative in your nearby A-C office, or write direct for "Streambarker Economics" bulletin B6391. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 2043

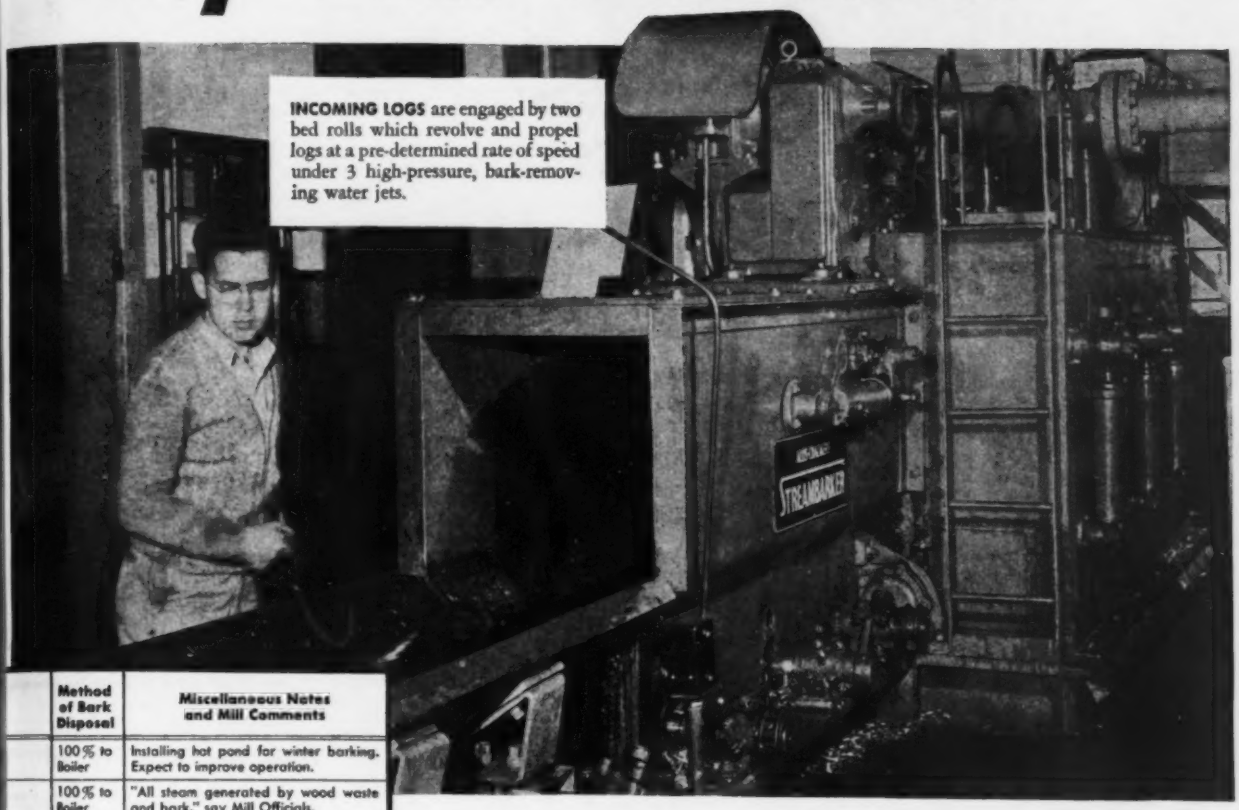
12 MILLS REPORT ON STREAMBARKER

MILLS	Species of Wood Barked	Size of Logs Barked	Streambarker Schedule		Water Pressure		No. of Men, Convey., Barker, Inspec.	Capacity		Process in which Streambarked Wood is Used
			Hours per Day	Days per Week	Summer	Winter		Summer	Winter	
MILL A	Spruce, Fir and Hemlock	4 to 18" diam., 4 ft. long	16 to 24	6 to 6½	750 lbs.	750 lbs.	4	9	6	50% Sulphite 50% Groundwood
MILL B	Spruce, Fir and Poplar	4 to 18" diam., 4 ft. long	9	6	670 lbs.	670 lbs.	3	10	8	100% Groundwood
MILL C	Spruce and Hardwood	4 to 20" diam., 4 ft. long	24—auxiliary to drums	6 to 6½	650 lbs.	650 lbs.	4			Bleached Sulphite
MILL D	Spruce	4 to 18" diam., 4 ft. long	9 to 12	6	730 lbs.	730 lbs.	4	13	8½	88% Sulphite 12% Groundwood
MILL E	Balsam, Hemlock, Spruce, etc.	4 to 20" diam., 4 ft. long	16	6	670 lbs.	770 lbs.	3 to 4	9½		60% Sulphite 40% Groundwood
MILL F	Spruce and Fir	3 to 18" diam., 4 ft. long	Auxiliary to drums	6	750 lbs.	750 lbs.	3			Groundwood, Unbleached Sulphite
MILL G	Spruce and Fir	3 to 18" diam., 4 ft. long	24	6⅔	780 lbs.	780 lbs.	4	9	7	100% Sulphite
MILL H	Birch, Maple, Beech	4 to 18" diam., 4 ft. long	17	6½	635 lbs.	635 lbs.	7 incl. unload, loading	9	7½	100% Soda
MILL I	Poplar and Spruce	4 to 20" diam., 4 ft. long	16	6⅔	750 lbs.	750 lbs.	4	10	7	100% Sulphite
MILL J	Spruce, Fir, Pine, Hemlock	4 to 20" diam., 4 ft. long	24	7	650 lbs.	750 lbs.	3	9½	6½	50% Sulphite 50% Groundwood
MILL K	Pine, Birch, Poplar, etc.	3 to 20" diam., 4 ft. long	8	6	675 lbs.	675 lbs.	5	10	6½	100% Soda
MILL L	Spruce	3 to 20" diam., 8 ft. long	16	6	675 lbs.	675 lbs.	4	10	9½	50% Sulphite 50% Groundwood

ALLIS A-C CHALMERS

One of the Big 3 in Electric Power Equipment—
Biggest of All in Range of Industrial Products

say Mill Officials!



INCOMING LOGS are engaged by two bed rolls which revolve and propel logs at a pre-determined rate of speed under 3 high-pressure, bark-removing water jets.

	Method of Bark Disposal	Miscellaneous Notes and Mill Comments
	100% to Boiler	Installing hot pond for winter barking. Expect to improve operation.
	100% to Boiler	"All steam generated by wood waste and bark," say Mill Officials.
	Bark to Dump	Streambarker used on wood which other barking equipment cannot handle.
	100% to Boiler	"Pulp quality raised materially," say Mill Officials.
	Bark to Incinerator	Booster pump for winter barking has recently been installed.
	100% to Boiler	Streambarker barks wood which other barkers cannot efficiently handle.
	100% to Boiler	Streambarker is first full-scale barker this mill has installed.
	Bark to Dump	One of 1st-Streambarker installations—yet low maintenance right along.
	100% to Boiler	"We've eliminated knot boring, hand-cleaning, etc.," state Officials.
	⅔ to Boiler, ⅓ to Dump	Streambarker cleans logs that cannot be cleaned by other barkers.
	100% to Incinerator	"Barker operation and capacity both very good," say Mill Officials.
	100% to Boiler	Booster pump being installed to raise pressure to 775 pounds.

NEW MOVIE RELEASE!

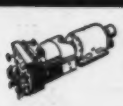
FREE 16 MM PRINTS now available of new color-sound movie, "The Case of the Barking Logs". Filmed during sub-zero weather, it shows entire Streambarker operation, inside and out; explains clearly its principles of operation. With film you will receive copies of illustrated 8-page booklet reviewing the movie. Film runs 9 minutes on 16 mm sound projectors. Copies available through A-C advertising Dept. Be sure to state approximate number of people expected to see movie. NOTE: This film offer good only in continental U. S. A. ALLIS-CHALMERS, MILWAUKEE.

PREPARATION—Hydraulic Barkers, Chip Screens, Saws, Slashers, Grinders.

COOKING—Digesters, Blow Tanks, Kilns, Heat Exchangers, Condensers.

WET ROOM—Vibrating Screens for use as Thickeners, dewatering rejects, etc.

PAPER-MAKING—special drives for Paper Machines, Rewinders, Calenders.



POWER—all types of Power Generation, Distribution and Control.

MOTORS and control—all types a-c and d-c, 1 to 7000 hp—Gearmotors.

TEXROPE V-belt drives—fractional to 5000 hp—constant and adjustable.

PUMPS—Single and Multi-Stage, 10 to 150,000 gpm—Paper Stock Pumps.

Canada's Industry Guards Finances

TORONTO — Whether or not the dire predictions of the more pessimistic that the world, more particularly the United States, is about to experience another depression, come true, Canadian pulp and paper companies have taken all the logical steps possible to help fortify their security holders if the worst happens.

Taking advantage of the favorable business and financial conditions during the year 1946 many pulp and paper companies have redeemed outstanding bonds, either partly or entirely, or refunded them on more favorable interest terms. Dollar parity enabled these companies to replace their two- or three-way pay bonds by bonds payable in Canadian funds only. The funded debt of leading pulp and paper companies has been cut this year from $227 millions at the end of 1945, to $175 millions, a reduction of 23 percent and fixed charges have been reduced even more — from $11 millions in 1945 to an indicated $7 millions on an annual basis at the present time, or nearly 40 percent. The cost of carrying outstanding pulp and paper funded debt has also been reduced from 4.82 percent to 3.95 percent.

According to The Financial Post, this large-scale capital structure revamping program has meant to holders of junior securities, increased per share earning power. Several companies have also strengthened the earning position of the common shareholders by refunding their preferred issues as well.

Changes made this year in the funded debt structure of companies with securities listed on Canadian stock exchanges include the following companies doing business in Ontario:

Consolidated Paper Co.—Cut debt by $7,220,000 and refunded the balance on a basis which cut carrying charges $1,046,741 annually.

Dryden Paper Co.—Redeemed formerly outstanding 6 percent bonds by a 4 percent bond issue.

Great Lakes Paper Co. — Refunded $4,750,000 of 5 percent bonds on a 3½ percent 20-year basis.

Minnesota & Ontario Paper Co. — Reduced its $6 million funded debt to $3 millions, out of working capital.

Provincial Paper Co.—Redeemed its $2,740,000 5½ percent funded debt, partly out of working capital, partly out of new preferred financing.

Abitibi Power & Paper Co. — Receivership terminated April 30, and under reorganization plan the company's funded debt became $53,093,700 against a nominal 1945 year-end figure of $62,273,000, including interest, premium on interest and on distributions to shareholders.

Other Canadian companies refunding during the year included the following:

International Paper Co. — In nine months ended Oct. 31, reduced debt structure from $46,568,000 to $18,441,000, a cut of 60 percent; bulk of this reduction represented by redemption on Jan. 1 of CIP's $15,286,000 outstanding first mortgage 6 percent bonds without resort to new financing.

Maclaren Power & Paper Co., wholly owned subsidiary Maclaren-Quebec Power Co.—Redeemed its $18,428,000 4 percent debt by an equivalent 3 percent bond issue.

Brown Co. — Resorted to financing operations this year increasing aggregate funded debt by approximately $4 million, from $15,099,000 at the end of 1945 to $19,099,000 at the present time. Increase was required to provide additional funds for the company's plant improvement program and to refund its RFC indebtedness. As a result debt carrying charges are up from $740,000 last year to $842,152.

Calder Finds 1947 Full of Promise

(Continued from page 7)

demand will make it possible for prices and production of particular grades to reach their natural levels. Equitable revision of prices should, I believe, tend to stabilize, and even increase production in certain categories.

"Another optimistic factor is the increasing emphasis being placed upon research in the industry. During the war the use of paper packaging expanded into many fields formerly dominated by other materials. Careful research and testing made this possible. The same research today is being devoted not only to finding new uses for paper, but also to creating new packaging machinery which will permit the use of economical paper containers in fields where they have not been used before. While some of these new war-created markets may be lost, quite a few should prove to be permanent.

"During 1947 Union Bag & Paper will complete an expansion program in Savannah costing several million dollars. Part of this program is the installation of a fifth machine, which will increase our paper capacity by 20 percent. In addition, before mid-year we expect to begin producing a line of kraft corrugated shipping containers in a new box factory under construction. This will provide a completely new industry and employment for about 400 more workers."

United Wallpaper Pays Dividend

CHICAGO—Directors of United Wallpaper, Inc., have declared the regular quarterly dividend of 50 cents per share on the 40,000 shares outstanding of the four percent cumulative convertible preferred stock. The dividend is payable January 15, 1947, to stock of record January 2, 1947.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending December 21, 1946

STOCKS

	High	Low	Last
A. P. W.	5	4¾	4¾
Armstrong Cork Co.	50	46¼	50
Celotex Corp.	28¾	27½	28½
Celotex Corp., pf.	21	21	21
Certain-Teed Products Corp.	20¼	19	20⅛
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	25¾	24⅛	25¾
Champion Paper & Fibre Co., pf.	109¼	108⅜	109¼
Container Corp. of America	47½	46½	47½
Congoleum Nairn Co.	28¾	27	28¼
Crown-Zellerbach Co.	32½	30¼	32⅜
Crown-Zellerbach Co., pf.	105¾	105	105¾
Dixie Cup Co.	33	32	32¼
Dixie Cup Co.—A	52½	51½	52
Flintkote Co.	35⅝	34⅛	35⅝
Flintkote Co., pf.	....	....	....
Robert Gair	7⅛	7⅛	7¼
Robert Gair, pf.	21	20½	21
International Paper Co.	55½	52⅛	54⅝
International Paper Co., pf.	105	104	104
Johns-Manville Corp.	136	132½	135½
Johns-Manville Corp., pf.	125	123½	125
Kimberly-Clark Corp.	24	23	24
Mac Andrews & Forbes	36¾	36	36¾
Mac Andrews & Forbes, pf.	....	....	....
Masonite Corp.	63	60	63
Mead Corp.	21¼	20¼	21
Mead Corp., pf., 4½	103½	103½	103½
Mead Corp., pf. 2	50	48¼	49¼
National Container Corp.	38⅜	33½	37¼
Paraffine Companies, Inc.	78	76	78
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	26⅜	24⅜	26⅜
Rayonier, Inc., pf.	36	35	36
Ruberoid Co.	57¼	55½	56½
Scott Paper Co.	50	48	48¾
Scott Paper Co., pf.	100¾	100	100
Sutherland Paper Co.	46¾	46	46¾
Union Bag & Paper Corp.	30⅞	28⅝	30¾
United Paperboard Co.	13½	12¼	13½
U. S. Gypsum Co.	110½	103½	110⅝
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	40¼	37½	40¼
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 3½s '60	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	....	....	....
International Paper Co. 5s '47	....	....	....
Mead Corp. 3s '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending December 21, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	44¼	41⅜	44¼
Hummel-Ross Fibre Corp.	27	25¾	26½
St. Regis Paper Co.	10¼	9⅜	10¼
Taggart Corp.	8½	8¼	8½

BONDS

American Writing Paper Co. 6s '61	....	....	....

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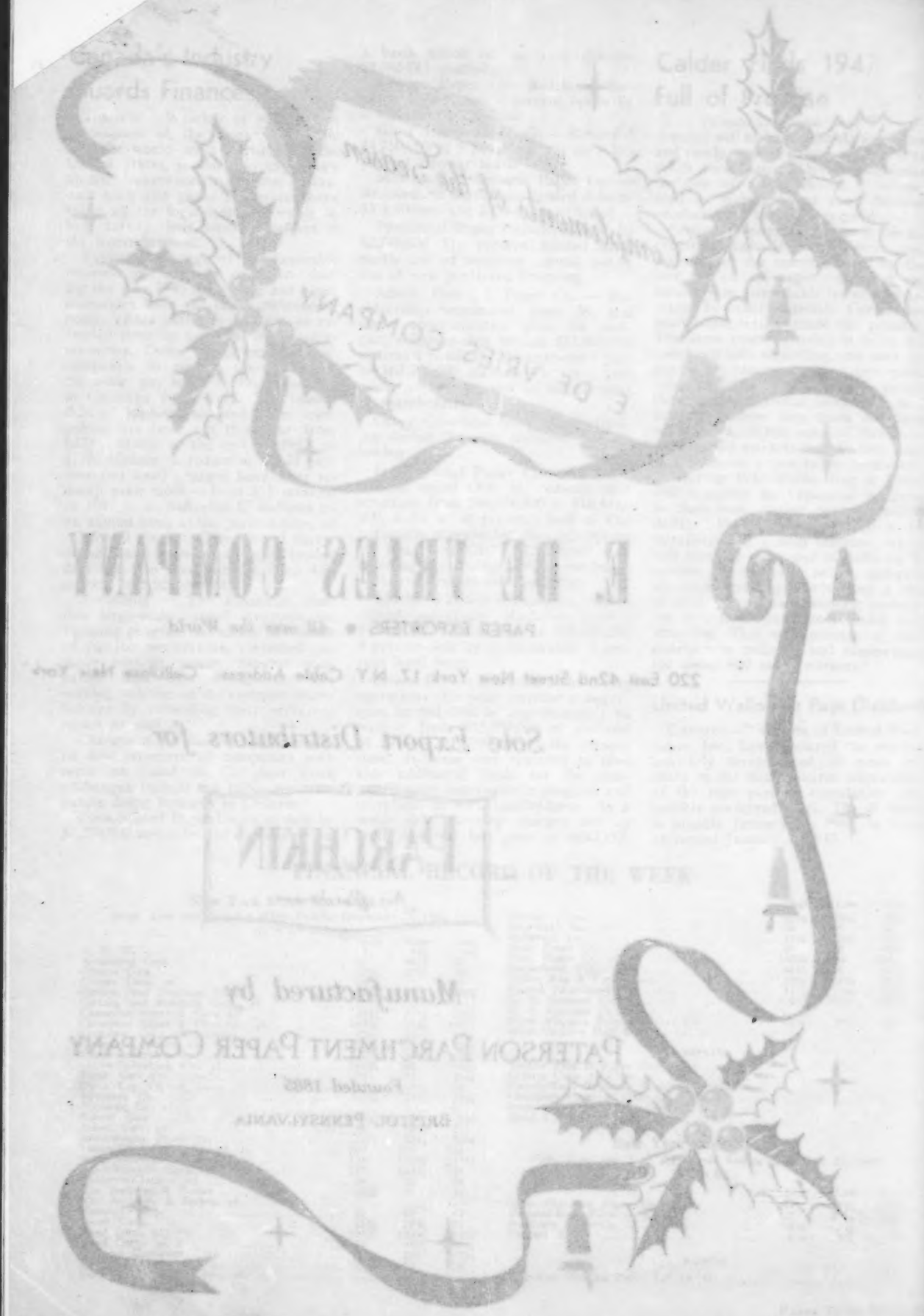


Ontario Receives Briefs On Forest Control Policies

TORONTO—The Ontario government's royal commission, appointed to inquire into the province's forestry resources and the manner in which they have been exploited, resumed hearings in Toronto last week and heard a number of briefs from interested parties. Chief among the presentations was one from the Forest Industries Association and one from the Co-Operative Commonwealth Federation (better known as the CCF political party).

Forest Industries Association asked for the outright repeal of the Provincial Forest Resources Act, which limits tenure of forest lands to one year. The association described the Act as a "threat to the security of tenure of forest lands." Claiming to represent individuals and companies holding cutting rights on 70 percent of Ontario forest lands, the association asked timber licenses "be extended from the present one-year term to from 10 to 21 years, subject to renewal."

"Prior to the Forests Resources Regulation Act, agreements under these classifications were always regarded as secure," the brief stated. "This act gives power to the minister of lands and forests to abrogate agreements and redistribute lands as he may see fit." This power, the brief contended, "was used in 1937 in connection with readjustment of pulpwood concession areas in sections of Northern Ontario to the serious disadvantage of some Ontario paper manufacturers."

The brief emphasized "the possibility of arbitrary cancellation of cutting rights" by the provincial minister of lands and forests by order-in-council must be eliminated "in the public interest."

The brief urged immediate action by both the federal and provincial governments to permit and encourage an increase in immigration into Canada from the British Isles and northern and central Europe, and stated: "The fact is there are not enough woods workers in Ontario."

"Given a dynamic forest policy and adequate provincial financing, an immediate start can be made on a much broader program than has previously been undertaken," the association stated. "Further delay can only aggravate a forest condition which has developed over the years through lack of far-sighted forest and financial policy."

Fred O. Robinson, a member of the provincial parliament, from Port Arthur, presented the brief for the CCF. The brief took Premier George Drew to task for granting concessions in Northern Ontario, notwithstanding his criticism of his predecessors for the same thing and suggested "a forestry commission similar to the Ontario Hydro-Electric Commission." "Exploitation has been in the hands of private individuals and companies which have been more concerned with immediate profit than with long-term programs. The political administration has been consistently short-sighted and bad."

The CCF brief listed seven suggestions for the improvement of Ontario's forest resources as follows:

1. Administration and management should be placed in the hands of a Forest Resources Commission, completely free from day-to-day political interference.

2. This commission should repossess existing concessions in a steadily expanding program, with equitable compensation where necessary, based on actual loss of investment, and should also proceed as circumstances warrant, with development of other areas.

3. The commission should as rapidly as possible obtain a complete inventory of our forest resources, determine the annual increment and develop a long-term program of scientific harvesting which will ensure the reproduction of our forests in perpetuity.

4. Special attention must be paid to the development of adequate forest protection and conservation methods, and sufficient staff employed for this purpose.

5. Research should be greatly expanded, with special attention to the fullest and most economical utilization of all the wood available for harvesting, and the development of new uses and new processing industries.

6. Conditions of forest labor must be greatly improved. Forest communities should be developed to provide civilized living conditions for workers and their families. Every encouragement should be provided for labor organization and the rights of collective bargaining fully protected.

7. There should be the closest cooperation between the Ontario forest administration and those of the Dominion and other provinces, with a view to combined action in such fields as forest conservation and the eventual development of unintegrated national forest policy.

Ben Avery, Kalamazoo Vegetable Parchment Co., Espanola, challenged the CCF spokesman to produce records of needless destruction of forests, and declared surveys had shown that 85 percent of cut-over areas had reproduced themselves. Pulp and paper and lumber companies, he pointed out, "had a tremendous responsibility" not only to the citizens of Ontario, but to those they represented in the company itself.

Questioned by Howard Kennedy, head of the commission, and Donald Guthrie, commission counsel, Mr. Robinson agreed that the CCF did not have as its intent the taking over of forest industries at once, but rather through a gradual process. The commission, he suggested, might operate as an administrative body and also as an operating organization by letting contracts, and, he agreed, the combination of private enterprise and public ownership might be effective after the taking-over period if the private companies "cooperated." Failing such cooperation, they would be taken over in their entirety, he said. The royal commission had advertised sittings for three days in Toronto, but Mr. Kennedy declared it seemed likely they would continue until Christmas and then adjourn for a time. Numerous briefs are yet to be heard.

Earlier in the day, William F. Gibson, Toronto, representing the Dominion Cellulose Company and the National Cellulose Company of Canada, had urged that forest resources be used to the limit and pulp and paper be processed in Canada. The industry could employ 214,000 more men if this were done, he said. "The dollar value on pulp sent to the United States is a small fraction of what it would be if the pulp were processed here. We can do this processing as well as it can be done in the United States," he said.

Powell River Plans for Eighth Newsprint Machine

VANCOUVER, B. C.—Plans were made recently by the Powell River Company, Powell River, B. C., for the construction of a new high speed newsprint machine, expected to be ready for delivery in early 1948. The letting of this contract marks still another step in a steady march of progress that has continued for close to half a century.

First two of the present seven paper machines went into operation in 1912 but even before they had been put into production an order had already been placed for two additional machines that went into production in 1915.

Next big step in the plant expansion came in the 1920's when the dam at Powell River was raised and installation of two modern units was started. The machines went into production in 1926.

Development of the Stillwater power site was started in 1929 when it was decided that mill capacity must be still further increased. A log crib dam was built on the Lois River and at the same time No. 7 machine was installed. It went into production in 1930.

The permanent dam at Lois River was built in 1939-40, though at that time it was not raised to a height which would allow total realization of power potential. That work is now under way and will likely be completed next year, well in advance of the new machine installation.

Ward Finds Profit In Staff Meetings

PHILADELPHIA — The annual Merchandising Committee meeting of the D. L. Ward Company was held last week at the Ritz-Carlton Hotel. The meetings, attended by 42 Ward officials and men and women of the organization, were the result of a program initiated by Ralph G. Luff, president of the company, last spring.

"When the committees were established," said Mr. Luff, in opening the two-day session, "it was the thought that we would bring directly into the problems of Management - Personnel not only the officers of the company, department heads, and the sub-managers, but also the key salesmen. This would mean we would have the benefit of the knowledge and experience of these men and use it to best advantage.

"These groups have given us assistance and counsel that we could not get otherwise, and, in my opinion, this working together of management and Ward men and women constitutes an important step forward in industrial teamwork.

"Since the committees were organized, there have been 28 meetings. The best record, for the most meetings, was that set by the Flat Paper Committee."

Not only do the Ward committees assist management of the company by making recommendations, drawing up plans for future operation of their own divisions, but they inform other committees of their work. Thus, all Ward committees keep minutes of their meetings and send these to other groups.

Twelve merchandising committees were established, and the chairmen of these groups made their reports, together with recommendations.

The meetings, which discussed market and sales conditions, as well as mill supply problems, were unusual in that they were held away from the offices of the company.

"This," explained Mr. Luff, "was to permit uninterrupted work on so important a problem. We just did not want to be interrupted while we were outlining our program for 1947."

Mr. Luff acted as chairman of the business meetings, and as host to the entire group at luncheons on both days and at a dinner on the final evening.

At the final dinner meeting, an on-the-spot ballot was taken to ascertain whether the committees should be continued. It was the unanimous opinion that they should continue, and that some should be enlarged.

Harry M. Rambo served as chairman for the Sanitary, Twine, Wrapping, and Food Packaging committees; L. M. Nauman, chairman of Specialties.

Miss Marie M. Quinn presented the Linweave Committee report; David L. Ward, vice-president of the D. L. Ward Company, Office Equipment; D. K. Conover, Book Paper; C. A. O'Neill, secretary of the company, Flat Paper; W. A. Hentz, advertising manager, the Advertising Committee; R. M. Dillon, Welfare; and Harry Heaps, personnel manager, the report on the Methods Committee.

A comprehensive written report of the two-day sessions was prepared by secretaries and submitted to all members of the Ward Company, to aid in further organization planning.

Wire Weavers Reelect Beck At Annual Convention

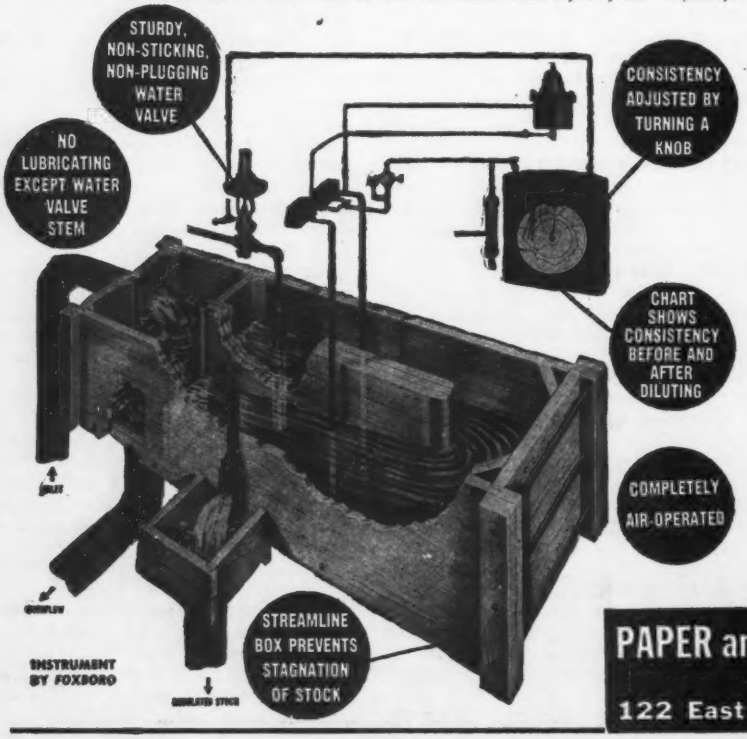
APPLETON, Wis.—John W. Beck of Cleveland, Ohio, was reelected president of the national executive board of the American Wireweavers Protective Association at its annual meeting here last week. The meeting opened Saturday, December 7.

William Duffy, Belleville, N. J., was reelected secretary and treasurer, and Peter Gargetic, Cleveland, Ohio, was elected vice-president, succeeding James Stoddart, Middle Village, N. Y. Others attending included Frank DeBruin, Appleton, representing employes of the Appleton Wire Works and the Wisconsin Wire Works, both of this city; Edward Powers, Belleville, N. J.; Charles Belton, Springfield, Mass.; and Mr. Stoddart.

The board discussed shop problems in the trade and outlined plans for the coming year.

BRAMMER RECORDING CONSISTENCY CONTROL

Licensed under U. S. Patent Numbers: 1,810,111—1,884,075—2,302,326—2,302,327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No moving parts in the stock. Highest efficiency in handling all grades of stock. Low maintenance costs. Complete air operation. Measuring and control efficiency at its maximum. No lags or bumps from mechanical friction.

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24 hour record chart, showing consistency before and after diluting water has been supplied.

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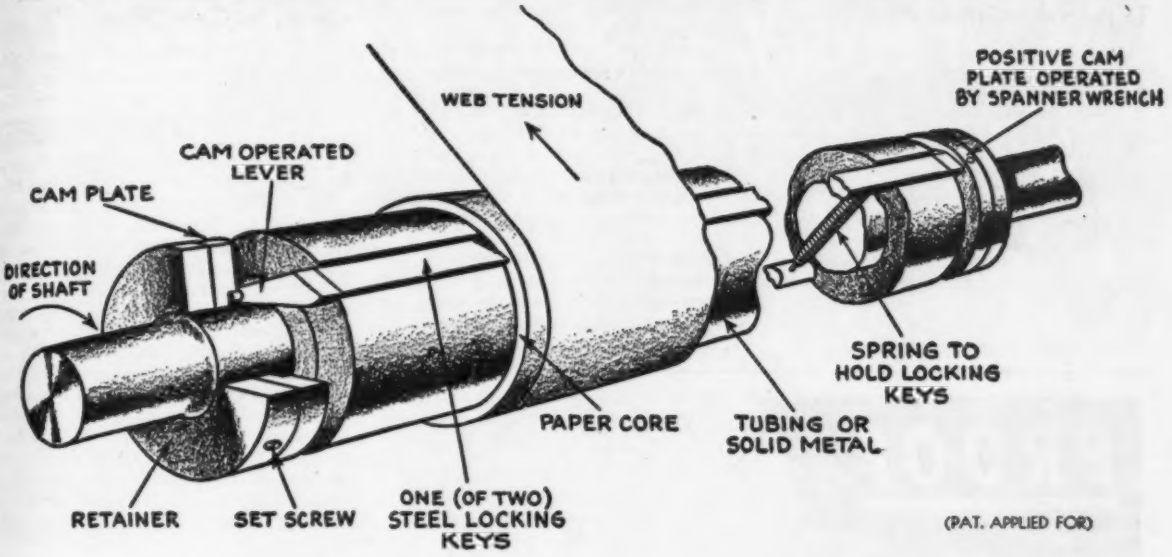


The Collette Winder Shaft—TYPE D

- Steel keys lock core firmly on shaft
- Increase in tension raises locking pressure
- Body made of magnesium tube for lightness
- Weight is about one half pound per face inch
- Particularly popular for 3" I. D. cores
- Ideal for drum winders and slitters
- Can be used effectively on most shaft winders
- Suited for both winding and unwinding operations
- No collars, wedges or other loose pieces
- Winds hard, uniform rolls; no distorted cores
- Speeds assembly of cores, reduces worker fatigue
- Cost is reasonable and commensurate with quality

WRITE FOR DIMENSIONAL DATA SHEET

UNION MACHINE COMPANY

FITCHBURG, MASSACHUSETTS

Package Machinery Takes Title To Pratt & Whitney Plant

SPRINGFIELD, Mass. — A check for $1,700,000, the largest to be issued in the history of industrial Springfield, was signed today by officials of the Package Machinery Co. The check was passed to a representative of the War Assets Administration for the East Longmeadow plant built by the government for Pratt & Whitney Aircraft during the war years.

The check was signed by Roe S. Clark as vice-president and treasurer of the company, and passed over to Edward G. Griffin of the War Assets Administration, who transferred the title and deed to Roger L. Putnam, chairman of the board of directors.

Package Machinery will take immediate possession of the plant and start work at once remodeling. Manufacturing facilities include one large building covering more than eight acres on a single floor. It was revealed during the ceremonies that Package Machinery is now manufacturing more than 70 different types of packaging machines, and constantly is developing new uses for them.

George Mohlman, president of the corporation, which was a pioneer in the packaging field, said the company had experienced severe growing pains in the past few years.

THE chart above, made at the plant of a large paper manufacturer, is positive proof of the constant, uniform delivery of Warren Machine and Jordan Chest Centrifugal Pumps. It shows a 24-hour record of stock level in the regulating box... head in chest varied from 0 to 8 feet, yet practically throughout the entire test, the Warren Machine Chest Pump maintained the regulating box level *constant to a fraction of an inch!*

A Warren Centrifugal Chest Pump gives you these advantages over a plunger-type pump: smooth flow without pulsation; discharge valve can be closed and not build up excessive pressure on pump and discharge line; takes up less floor space and much less head room; no pockets to hold old stock; a diagonally split case makes it unnecessary to remove discharge piping — rotating member can be easily lifted out; no noisy gears to create vibration.

The maintenance charges of a Warren Centrifugal Chest Pump are low as compared with a plunger pump. Renewable liners prevent wear on suction heads — there are no plungers to be turned or replaced. *And in addition, the initial cost of a Warren Centrifugal Chest Pump is lower than that of a plunger pump of much smaller capacity.*

A Warren Centrifugal Machine or Jordan Chest type pump . . . in operation in *your* plant . . . will assure uniform delivery under varying conditions of suction, submergence and density of stock. Write for complete information and list of installations.

Warren Pumps

CENTRIFUGAL *AND* RECIPROCATING PP-435

Warren Steam Pump Company, Inc., Warren, Massachusetts

Packaging Machinery Institute Opens Its Own Office

NEW YORK — The Packaging Machinery Manufacturers Institute has established its own independent office in Room 736 at 342 Madison Avenue, following its detachment from the Packaging Institute, Inc. The separation was voted by the Packaging Machinery Manufacturers at their annual meeting at Shawnee, Pennsylvania, following revision of the Packaging Institute by-laws to terminate the interlocking membership existing between the two groups since 1939, when the Packaging Institute was formed.

The Packaging Machinery Manufacturers group which was incorporated in 1933, had shared joint office and administrative facilities with the Packaging Institute at 342 Madison Avenue since 1939, until the recent change. Miss H. L. Stratton will continue as secretary-treasurer of the Packaging Machinery Manufacturers Institute.

In announcing the new headquarters, President George W. von Hofe called attention to the growth of the packaging machinery industry, saying that shipments of packaging equipment during 1945 were estimated to have exceeded by thirty-five percent those of the last pre-war year. "This growth," Mr. von Hofe said, "is reflected in the increased interest in the Packaging Machinery Manufacturers Institute, as indicated by the new membership applications we have received during the past few months and requests for assistance in trying to solve industry problems.

The informational service conducted by the office of the Packaging Machinery Manufacturers Institute, Mr. von Hofe said, will continue to give unbiased information on all types of packaging machinery.

The Institute plans to hold a spring meeting of the membership during the Packaging Exposition in Philadelphia in April 1947.

Jenssen Names Lundberg To Board of Directors

WATERTOWN, N. Y. — A. Halvar Lundberg, of Seattle, Wash., a native of Sweden and a chemical engineer with 30 years experience in papermaking, has been named a director of the G. D. Jenssen Company, Inc., here. Mr. Lundberg was associated with several Swedish pulp and paper companies. In 1924 he began his association with the Jenssen company, and in 1926 became its west coast representative.

Valley Iron Forms Credit Union

APPLETON, Wis.—Employes of the Valley Iron Works met in the main office Tuesday evening, December 10, to complete organization of the Valley Iron Employes Credit union. Rex Spencer is president.

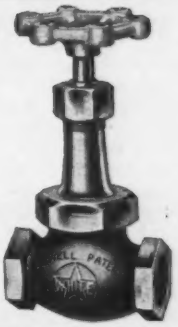
POWELL has the *right* Valves for *all* your Flow Control requirements!

125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Gate Valve.

200-pound Bronze Gate Valve with renewable disc.

This may sound like a broad statement—but we can back it up. Because, through 100 years of making valves—and valves only—Powell has always been ready with valves that are *right*—in both design and material—to meet *all* demands imposed by the amazing growth of American Industry.

Today the Powell Line includes Bronze and Iron Valves of every necessary type, size, design and working pressure; Cast Steel Valves of every type in pressure classes from 150 to 2500 pounds; and a complete line of Corrosion-Resistant Valves, including many special designs and made in the widest range of pure metals and special alloys ever used in making valves.



200-pound Bronze Globe Valve. Regrindable, renewable semi-cone plug-type seat and disc.

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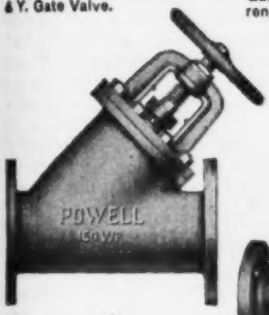
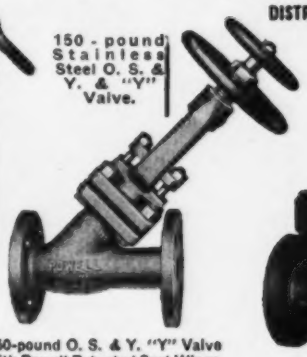


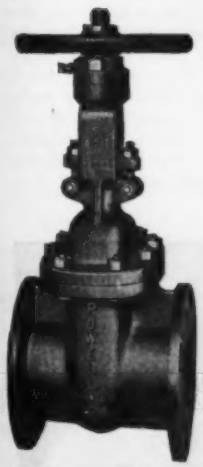
150-pound O. S. & Y. "Y" Valve with Powell Patented Seat Wiper.



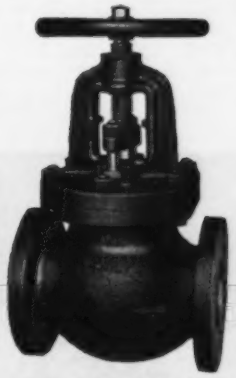
150 - pound Stainless Steel O. S. & Y. & "Y" Valve.

Large 250-pound Iron Body Bronze Mounted Regrinding Horizontal Swing Check Valve.

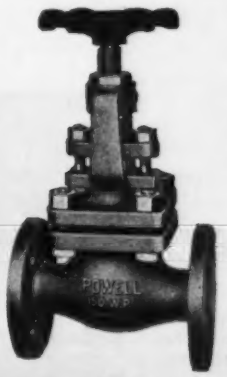
125-pound Iron Body Bronze Mounted "Master Pilot" Gate Valve.



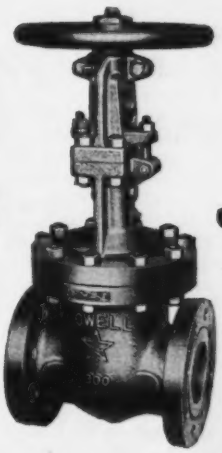
New Standard 150-pound Stainless Steel O. S. & Y. Gate Valve.



125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Globe Valve.

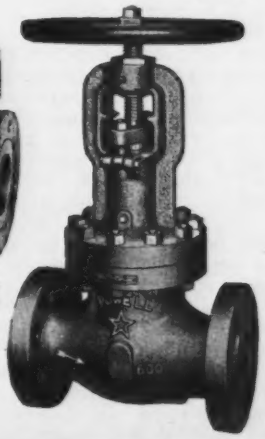


150-pound Stainless Steel O. S. & Y. Gate Valve.



Class 300-pound Cast Steel O. S. & Y Gate Valve.

Class 600-pound Cast Steel Globe Valve.



POWELL VALVES

Development of Jacketed-Type Steel Drier Rolls

By WILLIAM H. FUNK, *Development Engineer,* Lukens Steel Company

From an address before the American Society of Mechanical Engineers

In the early 1930's, a welded steel single shell drier roll was installed as a replacement in a bank of cast iron dried rolls. There had been a failure and the use of this steel roll was considered mainly because it could be obtained very quickly. This may not have been the first instance of the use of a welded steel drier roll. However, it did provoke considerable thought and discussion because of the increased operating efficiency and longer bearing life, through improved journal design. which resulted. These advantages have continued over the more than 12 years of nearly continuous service rendered by the dried roll which is operating in a mill making paper board.

Here was a new field for fabricated steel. Since then steel dried rolls have been accepted by many different industries such as paper making, printing, textile, film processing, plastics, rubber and chemical.

This early single shell drier roll was a duplication of the over-all design of a typical cast iron roll, except that the thinner shell and the heads were made an integral piece by welding. Fig. 1 shows this roll as it appears in the drying machine. The size of the roll is 3′ 6″ O.D. by 10′ 6″ face. The journals are designed with an insulating air chamber between the steam passage and the bearing to reduce the temperature on the bearing.

There were few who thought that this drier roll would be much different in performance than the conventional type generally in use. However, some engineers saw, through the use of fabricated steel design, the means of improving on several features inherent in conventional single shell drier roll design. A large diameter single shell roll requires very thick head sections which contribute substantially to the weight of the roll. If the steam were confined to an annular space between two shells, this heavy end design could be eliminated. The higher strength of steel plate would allow the use of lighter gages for the shells so that two shells plus internal stiffeners would weigh little, if any, more than a single cast iron shell. This weight reduction would be very beneficial in service. Fig. 2 shows jacketed drier rolls of this design before machining. They are 6′ 0″ O.D. by 5′0″ face. The journals were machined for roller bearings and a drive gear, and the face was machined to a polished finish. Fig. 3 shows a schematic drawing of a section of this roll. Note the absence of any heavy sections in these drier rolls.

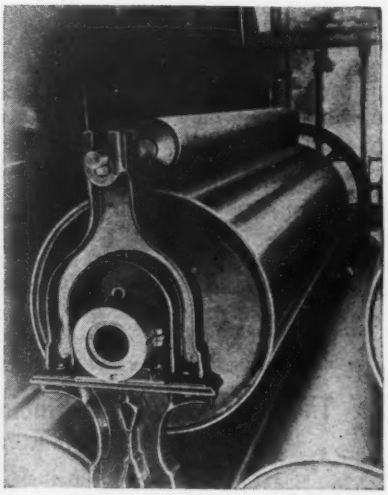


FIG. 1—Drier roll 3′ 6″ O.D. with a 10′ 6″ face used in a paper manufacturing process. The drier roll, with shell and head made an integral piece by welding, duplicates the over-all design of a typical cast iron roll.

In this double shell design the flat head plates, which close off the ends of the steam chamber and support the shells by spokes from the journals, also provide the means of passing steam into the annular shell space. Half-pipe sections, welded to the spokes, and holes drilled in the inner shell and journals, form a steam passage through one journal, across the face of the roll and out of the other journal. Some of the earliest jacket-type steel drier rolls designed and built in this manner were used by a publishing company to dry printed ink.

The next consideration in furthering the design of the jacketed-type drier roll was better condensate removal. Jacketed-type steel dried rolls already built were operating very satisfactorily and more were being fabricated. However, it was acknowledged that a more positive method of removing condensate should be incorporated in future designs. As a result a Yankee drier roll was built with two provisions for condensate removal incorporated in the design. Fig. 4 shows this dried roll which is 8′ 0″ O.D. by 6′ 10″ face. Every section on this drier roll is now serving a double function, since each piece is a strength member and is also part of a steam passage. The steam inlets have become pipe spokes and the end plates have become rings acting as closure plates only. The condensate provision used at slow speeds is a scoop arrangement and was designed to pick up the water lying at the low point of the drier and remove it. At higher speeds when the condensate rotates with the roll this scoop would not remove the condensate. A pipe, therefore, is inserted through the inner shell so that the open end of the pipe is very close to the inner surface of the outer shell. This pipe draws off the condensate leaving a water film, the depth of which is equal to the clearance between the pipe and the shell. Valves in these condensate lines make it possible to use the drier roll at any speed and still evacuate the condensate. The passage of steam in this drier roll is through one journal, into

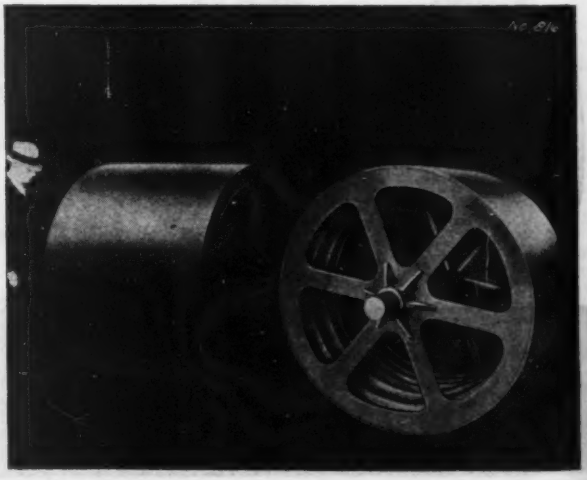


FIG. 2—Jacketed-type drier rolls before machining. Each is 6′ 0″ O.D. with a 5′ 0″ face.

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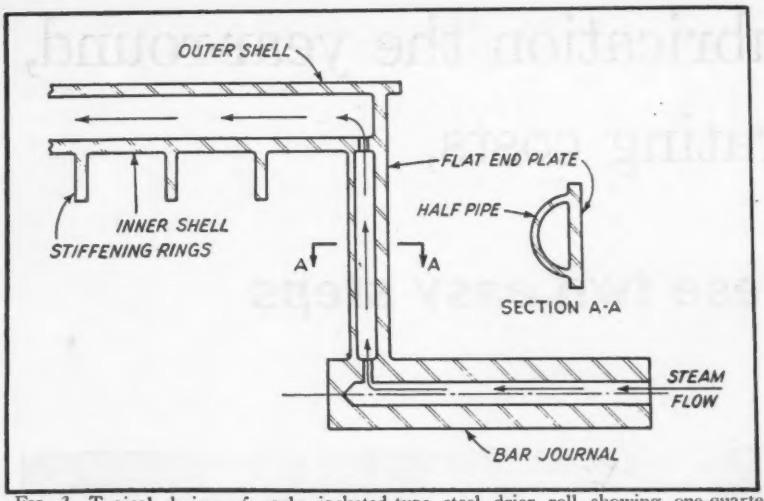


FIG. 3—Typical design of early jacketed-type steel drier roll showing one-quarter section of roll.

the pipe spokes at both ends of the roll, and into the jacket space, from the center of which, by one system or the other, the steam and condensate are removed through the opposite journal. The pipe spoke design is an improvement over the one used in the earlier drier rolls because in the current design there are no unheated sections to restrict roll expansion. Stiffeners on the inner shell have been eliminated. These drier rolls may be closed at the ends to keep heat losses from the inner shell at a minimum.

The operation of this first Yankee drier roll definitely indicated that the jacketed-type design was more efficient than a single shell design. The roll was first operated at the speed and steam pressure previously used with the cast roll it replaced. Flashing and burning of the tissue paper being made, resulted. To produce the paper satisfactorily the steam pressure was reduced to less than 5 psi. and the speed of the machine was increased. Later the pressure was raised slightly and the speed increased still further. This jacketed-type steel dried roll, currently produces more paper than was possible with the cast iron roll, although it uses exhaust steam instead of live steam directly from the boiler. Tissue paper has been creped from this roll ever since it was installed and the doctoring action has not been detrimental in any way. This doctoring is a scraping action on the face of the roll, while it is in operation, for the purpose of creping, flaking, cleaning or polishing.

The field of use for these jacketed-type steel rolls was also extended while the design was being developed. Jacketed-type rolls 10′ 0″ O.D. were fabricated for use in the processing of light plastic films. The nature of the product requires that these rolls, designed to use warm water as a heating medium operate with a very uniform surface temperature. Fig. 5 shows this roll unmachined with the small pipes through which the warm water is distributed and the diffusing manifold inside the inner shell. The pipe spokes on each end of the roll are the return lines only. The heavy blocks on the spokes are for attaching the driving mechanism. The face of the roll is later polished to a high finish.

A jacketed-type roll 2′ 6″ O.D. was fabricated and chrome plated on the face for a pharmaceutical company to flake, by doctoring, a product of crystalline form. This rall has given trouble-free service for about seven years at an approximately 20% higher rate of production than that of similar units using single shell rolls.

For high temperature requirements of around 700 F. jacketed-type rolls are supplied to chemical manufacturers. These rolls have a variation of the jacketed design which may best be deschibed as a labyrinth for the circulation of any special heating medium. Rolls of this type are particularly applicable for installations requiring very high pressures, very high or low temperatures, or where a heavy load is applied externally. The total thickness of the shell plate may be about 2½″, with the steam passages still very close to the outer roll surface.

The acceptance of these jacketed-type drier rolls for a variety of uses offers proof of their value in most industries where the principle of drum-drying is used or is applicable. The advantages to be gained by the use of this type of roll for drying, cooling or any other processing done on drum-type rolls can be grouped in several categories. First, welded steel fabrication makes possible a wide range of roll design from which a roll can be readily adapted to a specific use. Second, the design selected contains mechanical advantages that are not found in any other type rolls. Third, the jacketed-type steel roll also has features which will raise its operational efficiency above that of the conventional-type rolls. Fourth, these advantages generally reflect savings in initial costs, operating expenses and operating time.

The design of a jacketed-type steel roll is limited only by the imagination of the designer, who must however, acknowledge certain physical limitations which cannot be overlooked. Among these are transportation problems. A roll 15′ 0″ O.D., or larger, may be shipped provided the face width or over-all length is not too great. The fabricating facilities available must be considered. Can a cylinder 10′ 0″ in diameter with a 16′ 0″ face be formed from a plate of 2″ thick steel? Are assembling and welding facilities adequate for the design contemplated? Are furnaces available to stress relieve a roll of the size desired? Stress relieving is considered a necessity if the roll is to hold its true shape in operation. The manner of stress relieving has also been found to affect the dimensional stability of the machined drier roll. Are the machining facilities available for a roll of the size contemplated and can the type of finish desired be obtained? These are typical limitations mentioned because they are the only kind of physical limits imposed on the designer. The costs of special patterns or dies do not have to be considered in designing a drier roll of any diameter or any variation of a standard design.

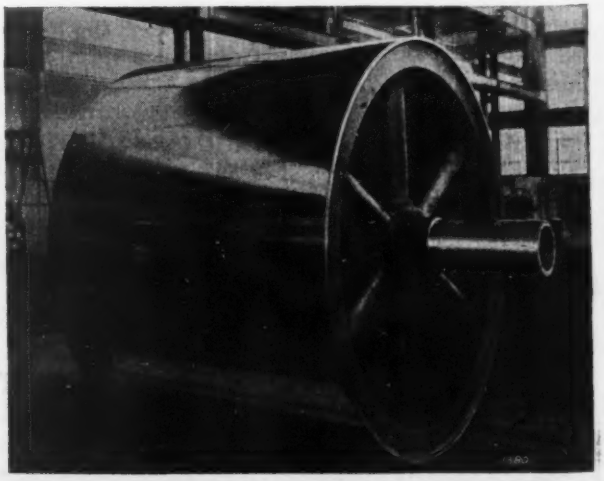
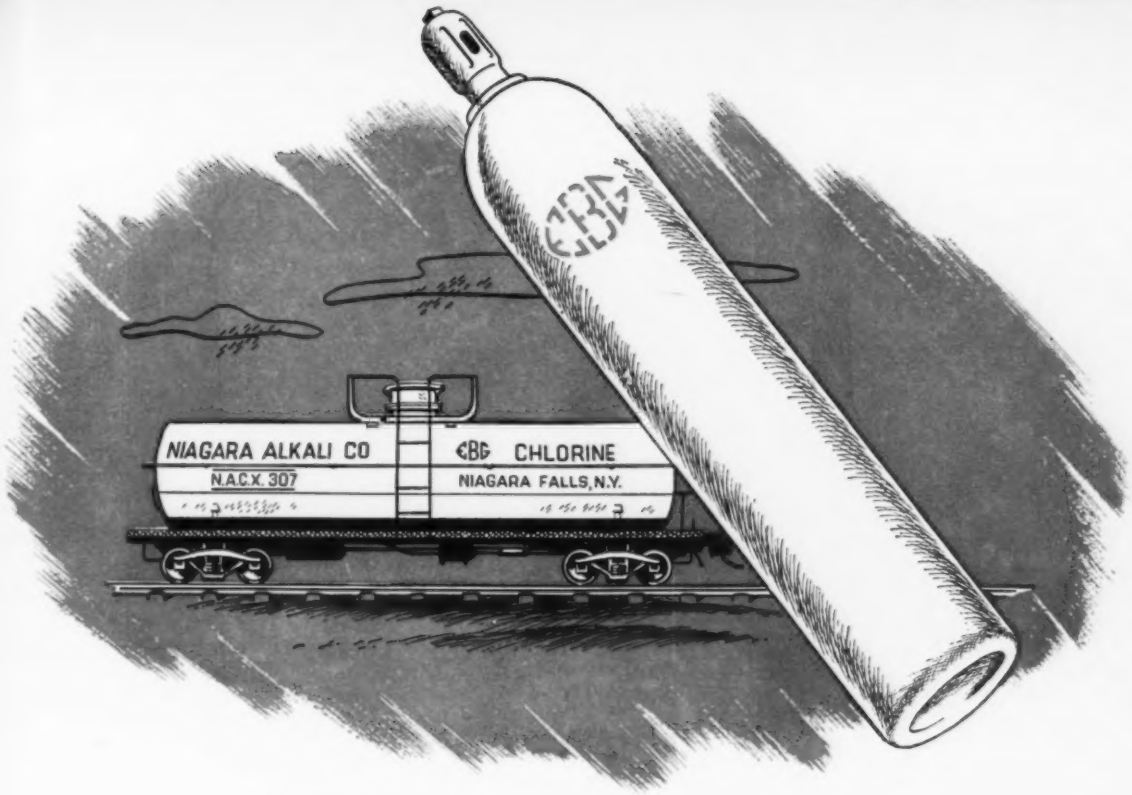


FIG. 4 — Yankee-type jacketed drier roll, 8′ 0″ O.D. with a 6′ 10″ face and weighing 17,685 lbs. Each section of this roll serves a double function as a strength member and as part of a steam passage.



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These limitations are in no way alarming for the possibilities in welded steel designs are virtually untapped. Rolls can be made for higher pressures than weer ever practical before. They can be made so that they will give constant and uniform temperatures over the face. A jacketed-type steel roll also can be designed with a solid stainless shell or with a clad steel shell to resist corrosion or prevent contamination of the product. The jacketed-type steel roll can be designed for use when chromium, nickel or other plating is desired on the face.

The mechanical advantages incorporated in the design vary to a degree with the size of the roll and the design selected. A jacketed-type roll 3′ 6″ O.D. and under, will not be lighter than a typical single shell roll but larger diameter rolls do show an appreciable weight saving which is reflected immediately in the design of the supporting frames and in the drive unit for the roll or rolls. The bearings for the roll can be smaller because of this weight saving and also because the relative strength of steel versus cast iron permits designing smaller journal diameters. There is added mechanical safety in the use of welded rolls in case of failures under pressure. If, for any reason, too much pressure is applied to the roll, the steel plate will distort to a noticeable extent before fracture occurs. This reduces to a minimum the chance that a roll failure may cause property damage or personal injury due to a sudden explosion. With a welded roll there will be no bolted or riveted joints that may from time to time become loose and leak. A drier roll 10′ 0″ O.D. by 8′ 0″ face was designed for 100 psi. steam pressure. The roll was machined under a water pressure of 100 psi. and was being prepared for a final hydrostatic test at 200 psi. when the pressure was accidentally raised much higher than the 200 psi. specified. Instead of exploding, the weakest section of the roll, which was the outer shell plate, distorted and relieved the excess pressure. The permanent distortion of the shell plate was the only indication of failure. The maximum permanent set was about 1¼″. Still higher pressure probably would have blown a hole in the shell, but there would have been few flying fragments. The outer shell of this drier was replaced and remachined. The drier roll is now in operation.

The welded roll, designed correctly for its intended use, has operational advantages over a conventional-type roll. The jacketed design, which is adaptable to most uses, guides the stem in a restricted area across the inner surface of the face of the roll. The net cross-sectional area inside the roll which contains steam is therefore much less than that of a single shell roll. If it were assumed that a jacketed-type drier roll in operation has the same surface speed, operating pressure, rate of drying of paper and rate of condensation in the roll as does a single shell roll, one thing becomes apparent: the steam velocity in the jacketed roll must be greater by the same ratio as the net cross-sectional area is smaller. In considering what this greater steam velocity does in the jacketed-type roll it is found that, first, it reduces the film on the inner surface of the shell plate. This film offers considerable resistance to heat transfer through the shell. Second, it minimizes the possibility of dead steam in the roll. Steam is guided into this jacket thrugh a series of inlets spaced around the roll in a manner designed to keep all the steam in the roll in controlled motion. Third, the feature not only of channeling all the steam but also moving it at a higher velocity, is better insurance that air in the entering steam will be flushed out immediately with the exhaust steam and condensate. Dalton's Law of Partial Pressures states that the total pressure exerted by a mixture of gases is equal to the sum of the pressure which each gas would exert if it alone would occupy the whole volume. This law can be interpreted to mean that any air in the steam chamber of the drier roll will cause the actual steam pressure to be lower than that indicated by a gage in the steam line. As a result, the temperature in the drier roll will not correspond with the steam temperature at that pressure. Just a small percentage of air in the roll reduces the drying rate of the machine. Fourth, the greater velocity of the steam and the guiding feature of the narrow steam passage maintain a more uniform surface temperature across the face of the roll. Also, the rate of heat transfer improves as the steam velocity increases.

FIG. 5—Jacketed-type drier roll used in the processing of light plastic films. It is 10′ 0″ O.D. with a 5′ 0″ face and weighs 18,900 lbs. The over-all journal length is 7′ 10″. Blocks welded to the spokes are for attaching the driving mechanism.

By examining the assumption, with these features in mind, it is apparent that the rate of drying must increase because the conditions tending to retard heat transfer have been improved. Increased drying ability must be offset by increasing the operating speed if the residual moisture content of the sheet being dried is to be held constant.

Unfortunately, the nature of this increased operating speed, which is a measure of the productive efficiency of the drying machine, cannot be calculated to any degree of accuracy. There are too many indeterminate variables in a drier roll section of a machine in addition to the roll itself that have a direct bearing on the drying rate.

Fig. 6 shows the basic formula for heat transfer.

Fig. 7 shows the various components of the over-all conductance. The

$$Q = U \times A \times \Delta T$$

Where Q = Heat transferred in BTU/hr

U = Over-all coefficient of conductance in B.T.U./hr/sq. ft./°F

A = Area in square feet

And ΔT = Temperature difference in °F between the steam and the sheets to be dried.

The value for U can be derived from the following formula:

$$U = \frac{1}{\frac{1}{h_1} + \frac{1}{h_2} + \frac{1}{h_3} + \frac{1}{h_4}}$$

Where h_1 = Conductance of condensing steam

h_2 = Conductance of film on inside of shell (dirt, scale, etc.)

h_3 = Conductance of metal shell

h_4 = Conductance of film on outside of shell.

FIG. 6—Basic formula for heat transfer.

jacketed-type steel roll is not thought to affect appreciably the values of h_3 and h_4. It is known, however, that better heat transfer is obtainable from jacketed driers without altering the drying area A or the temperature differential ΔT, in Fig. 6. It is assumed then, that h_1 and h_2, the conductance of the condensing steam and the inner film, are the factors which cause this better heat transfer. How to evaluate this assumption is not definitely known. There is very much more development required before the best heat transfer rates will be obtained for the jacketd design. The only reliable methods known at this time, to measure the increased efficiency of a drying machine, which may be due to the use of a jacketed-type steel dried roll, are a practical test or by laboratory research. At this time, it should be pointed out, that regardless of the type and weight of the sheet being dried, a function of the drier roll is always to promote the evaporation of moisture from the sheet. Most of the heat absorbed during evaporation is supplied by the latent heat released when steam in the roll is condensed. Basically, then, a better heat exchanger will be a better drier, provided the additional heat is released through the shell and is not lost through radiation from the ends of the roll. To reiterate, increased drying ability must be offset by increasing the operating speed.

A practical test performed in the following manner confirms the theoretical assumptions which have been mentioned. Ten jacketed-type steel drier rolls were installed in a paper machine in a felt mill to replace 10 cast driers in a bank of 54 single shell cast iron rolls. This felt mill produces the felt base for roofing materials and for floor coverings such as linoleum. The operating steam pressure for the cast iron rolls was 50 psi. while the pressure of the jacketed rolls was increased to 150 psi. No other changes in the machine, or in its operation, were made. The production rate was increased approximately 8% to 10% over the average rate before the replacement. Where corresponding increases in pressure and temperature are possible this increased efficiency presents an interesting comparison. Keeping in mind that this installation has only 10 out of 54 rolls changed it can be figured that at 150 psi. pressure the jacketed drier rolls show an increase in efficiency of from 40% to 50%. The efficiency increase, due to the increased pressure based on data collected from several sources, is estimated to be about 30% to 33%. The remaining increase in efficiensy of about 15% must be attributed to the jacketed steel design of the drier rolls.

In order to determine the relative efficiency of the jacketed-type steel drier roll at the original operating pressure of 50 psi., the pressure on the steel drier rolls was reduced to 50 psi. and observations weer made with the machine running under conditions similar to those existing before the steel dried rolls were installed. Results nidicated that the residual moisture content of the sheet was 28% less when the steel drier rolls were used, and that the average operating speed was increased 4.6%. Again, noting that only 10 of the 54 rolls were replaced with steel drier rolls, it can be seen that each jacketed-type steel drier roll demonstrated an increase in efficiency ot nearly 25%.

A conservative appraisal of this practical test indicates that 18% is a safe figure for increased efficiency of small diameter drier rolls. This figure is much more conservative for large diameter drier rolls and for Yankee drier rolls.

The jacketed-type steel drier roll effects savings in initial costs in several ways. For a desired production rate this type of roll in a new machine reduces the amount of floor space needed by reducing the number of driers required. This may mean actual savings in building costs. Medium to large size rolls are, by comparison, more economical to purchase. Accompanying frame and bearing costs are lower because of reduced weight.

The hazards in fabricating a welded steel roll are not so great as in casting a roll. The larger the roll the more apparent this becomes. If, for instance, a shell plate for a steel roll is damaged in processing it can be repaired or replaced for a fraction of the cost of casting a new roll.

Operational costs also may be reduced by virtue of reductions in weight and design. Lighter equipment requires less horsepower for driving. The jacketed-type steel drier roll requires no shut downs for tightening bolts to stop steam leakage. The jacketed design reduces the time required to bring the roll to operating temperature. The usual starting delays are cut to a minimum whether the roll is operated with steam or with water because there is no large volume of cold water in the bottom of the roll to be removed or to be brought to temperature. For an equal number of driers, the operational costs per ton of finished product are reduced when the operating efficiency is increased.

Difficulties were encountered in developing the jacketed-type steel drier roll to its present status. Fortunately, however, they were generally fabricating problems and were confined to the weld shop. The experience gained through the solution of these problems has contributed greatly to the development of these drier rolls to their present standards. Data are available on the fabrication of nearly 200 steel drier rolls now operating in many different industries. All these rolls have satisfactory performance records and most of them have been contributing factors in increasing production on the drying machines in which they are operating. Only one of these rolls has given a purchaser reason to criticize its physical stability. This one roll, a Yankee drier, 10′ 0″ O.D., developed an out-of-round condition within a year after it was put into operation. This out-of-roundness was confined to a flat spot over an area near the seam weld of the outer shell plate. The reason for this occurrence was traced to incorrect processing before the roll was machined. The method of processing was changed, and rolls fabricated since that time have maintained their size and shape satisfactorily. The out-of-round condition on the 10′ 0″ O.D. roll was not serious enough to prevent making tissue paper and napkin paper at speeds of over 1000 fpm. on it for four years before it was remachined to a true diameter. That roll is still operating at 1000 fpm. and should give no further trouble so far as dimensional stability is concerned.

There are certainly some problems which are yet to be overcome by the designers of jacketed-type steel rolls. Steel plate used to form the outer shell of the drier roll has been developed to provide the soundness required for any type of machine finish, including the highly polished surface needed as a base for plating. At present, however, a weldable steel is not available to give a surface hardness comparable to cast iron. This may or may not be detrimental when doctoring is necessary on the drier roll. Successful installations where doctoring is performed have been discussed. Additional research by both steel fabricators and manufacturers of doctor blades to improve this condition is still to be performed. Present designs available for jacketed-type rolls undoubtedly will be improved upon as more actual operating data are collected.

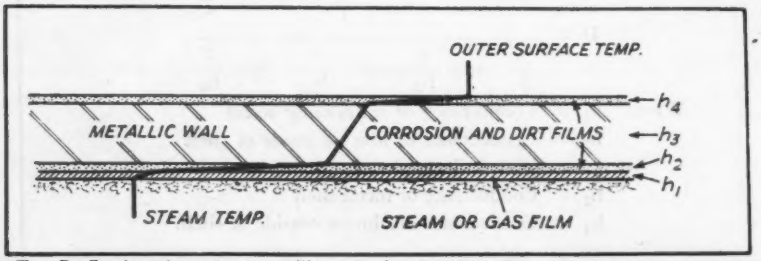

FIG. 7—Section through a metallic wall showing the effect of condensate, corrosion and dirt films on the transfer of heat through the wall.

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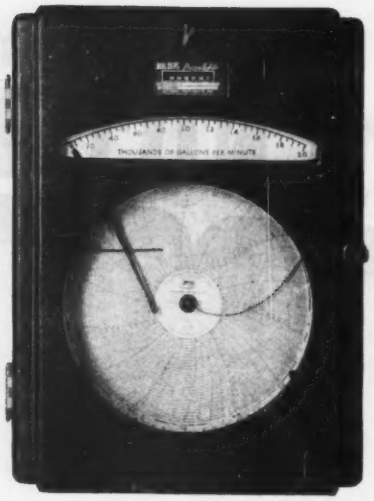
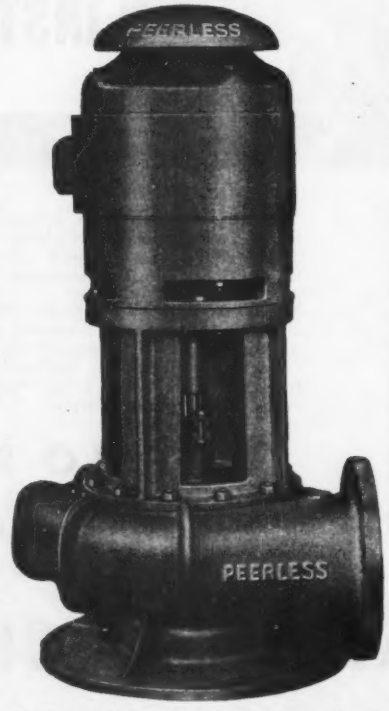
Ranney Method Produces More Cool Pure Water For Mills

Ranney Water Collection Corporation of New York reports three underlying principles of the Ranney Method of abstracting water from the ground or by infiltration through permeable beds of rivers or other bodies of water. They are: 1, Exposure of a large area of water-bearing formation to horizontal screen pipes, the number and area of which can be extended at will. 2. Selective removal of the fine material from the aquifer in the vicinity of screens and the formation thereby of more permeable ground or a gravel pack adjacent to the screen, so that each installation consists of a series of radiating drainage channels emptying into a central shaft. 3. Access to, and independent control of, each radial pipe, permitting each backwashing or flushing of each screen section separately.

Because of these features and because of the horizontal collecting pipes are located for their entire length below the drawdown level of the ground water, Ranney Units can be used to develop a water supply at a particular site of a quality and quantity that may not be economically obtainable by conventional methods. A completed Ranney Unit of standard type comprises a monolithic shaft 13′ inside diameter, with reinforced concrete walls 18″ thick. The shaft, or caisson, is sunk down through the water-bearing strata and sealed at the bottom with a heavy, reinforced concrete plug. Perforated screen pipes, 8″ in diameter, are then projected horizontally into the aquifer at selected levels through precast portholes in the shaft wall. These screen collector pipes are pushed to lengths, under favorable conditions, exceeding 300′. The number of pipes is determined on the basis of capacity of water desired and hydrogeological conditions encountered. On the inner end of each



pipe is a gate valve with an extension stem reaching to the pump house above, so that any one, or all of the horizontal collector pipes may be closed off at will. Multiple-stage, deep-well pumps have columns extending down into the shaft, which is a clear well. These pumps deliver water from the underground reservoir to the water mains. The Mead Paper Company has three of these units in operation, and the Ranney company has just commenced construction of a collector for the International Paper Company in Springhill, Louisiana, which will cost in the neighborhood of $250,000, and should produce a permanent supply of water of about 7,000,000 g.p.m.



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Peerless Issues New Bulletin On Vertical Centrifugal Pumps

A new 6-page bulletin has just been issued which describes the design, construction and application of three types of Peerless Vertical Centrifugal Pumps for general purpose pumping in a wide variety of industrial services such as sump and drainage pumping, general water supply, mine station service, cooling tower service, etc.

The Peerless Vertical Centrifugal water pump line, includes both submerged and close-coupled types — the submerged types being furnished with either top or bottom suction. Each of these types is adapted to all forms of power drive, including direct-connected electric, right angle gear, and belt (V or flat) as well as combinations of these forms.

In general all three types develop capacities from 200 to 5,000 gallons per minute and will pump against heads from 20 to 100 feet. The bulletin illustrates all three types of pumps, including comprehensive parts diagrams. Copies may be obtained by writing the manufacturer, Peerless Pump Division — Food Machinery Corp., 301 West Avenue 26, Los Angeles 31, California.

Allis-Chalmers Feeder Designed for Hi-Density

A new Hi-Density feeder for use in conjunction with a standard centrifugal paper stock pump for the handling of pulps up to eight percent bone dry consistency has been announced by the Allis-Chalmers Mfg. Co., Milwaukee, Wis. Elimination of air binding difficulty is claimed for the new unit. One of the best suited applications for this

Take a Tip From the Products You Use Every Day...

They're made with the aid of BECKMAN pH CONTROL!

WHAT ABOUT YOUR PRODUCT?

FEW PEOPLE—even those in industry themselves—realize the many diversified ways Beckman pH Control is being used to cut costs, reduce waste, improve operating efficiencies and insure a more uniform quality in dozens of products of daily use. For example . . .

The gasoline you use was probably refined with the aid of Beckman pH Control. Major refineries use Beckman pH Equipment to control the acidity of their processing operations, thus, not only improving the product, but also minimizing corrosion of costly plant equipment.

The paper you read in your magazines and books, as well as that which you use in your own catalogs and literature, are both made under the close control of Beckman pH Equipment. The paper mills manufacturing the finer qualities of paper use Beckman pH Control to regulate acidity in their processing operations and to insure more uniform printing qualities in the finished paper.

The sugar you eat was undoubtedly refined under the close control of a Beckman pH instrument—for accurate pH control has become an indispensable part of every well-managed sugar refinery.

The suit you wear, as well as your sox, shirt and other textiles you and your family use were probably produced with the aid of Beckman pH Control. It insures color-fastness, more uniform quality, greater strength in the finished fabric.

WHY NOT YOUR PRODUCT? Example after example can be cited where the job is being done better *for less* by means of Beckman pH Control. Chances are in *your* plant there are many important savings to be made through the installation of Beckman pH Control. Wherever there's water, there's pH—whether in chemical solutions, fluid pulps, moist pastes, sludges, industrial wastes or vat and tank processes. And wherever water or water solutions are used, chances are product quality can be improved, waste reduced and operating efficiency increased through the use of Beckman pH Control.

Why not find out about *your* product? Our trained engineering staff will be glad to work with you in recommending what can be done—possibly is already *being* done—in your particular field of industrial operation. *Beckman Instruments, National Technical Laboratories, South Pasadena 16, California.*

FACTS YOU SHOULD KNOW ABOUT BECKMAN pH EQUIPMENT

...that Beckman pioneered modern glass electrode pH equipment, transforming the cumbersome laboratory apparatus formerly used into a compact, practical portable instrument that paved the way for today's simplified pH measurement and control.

...that the first completely automatic glass electrode pH indicator, recorder and controller was pioneered by Beckman. Operating entirely without batteries, this instrument made automatic process control accurate, convenient, practical—and is today widely used in all parts of the world.

...that the only High Temperature Glass Electrode system available today is a Beckman achievement. This electrode system for the first time, enables continuous pH measurements to be made at temperatures up to 212°F (100°C) and is of tremendous value wherever hot process fluid must be controlled.

...that the only High pH Glass Electrode system is also a Beckman development. This is the only glass electrode that can be used to measure high pH values *even in the presence of sodium ions*... and extends the usefulness and accuracy of glass electrode equipment to many industries where alkaline solutions in combination with sodium ions have heretofore presented difficulties.

The above are only a few of many developments that make Beckman pH Equipment the only pH instruments embodying every modern advancement in the field of pH measurement and control.

FREE..."What Every Executive Should Know About pH"—a helpful, non-technical booklet containing much valuable information on the subject of pH—what it is—how it is used. Send for your copy today.

BECKMAN **INSTRUMENTS CONTROL MODERN INDUSTRIES**

machine is on sulphite and sulphate bleach systems where bleaching at high consistencies is desirable. On one installation of this kind, up to 9.7 percent consistency sulphite is being handled from the thickener to the bleach retention tower.

Another application is on slushing systems where the stock is stored at high consistencies and pumped to the beaters at the consistency at which beating is desired. This eliminates the expenditure connected with the storing of wet lap and the labor necessary to transport it from storage to the beaters where it is added to bring the beating consistency up to the desired value.

The standard size feeder fits into a tank enclosure 62 inches in length, but any size can be furnished by varying the shaft length to suit installation requirements.

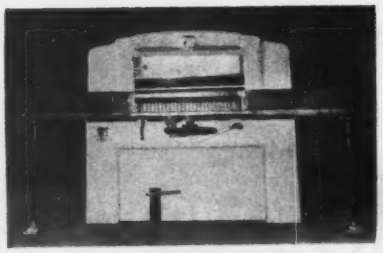
Aerovent Automatic Roof Ventilators Good Exhaust

The Aerovent Fan Company, Piqua, Ohio, manufactures the Aerovent automatic roof ventilator for industrial application, such as in paper and pulp mills, where positive exhaust is needed for general ventilation or for the removal of smoke, dust, fumes, steam, excessive heat, etc.

The butterfly discharge dampers automatically open when the fan is operating, allowing the free passage of air through the discharge stack without back pressure or turbulence, thus insuring the full capacity of the fan and the highest operating efficiency. When the fan is turned off the dampers close, sealing off the discharge stack and proventing down drafts.

Lawson Delivers Two New Cutters

Deliveries are now being made on the first of a complete line of new paper cutters—the Lawson "38". Designed by Fred Seybold, Lawson's chief engineer, the new cutter features many new and exclusive innovations, and embodies some of the most ingenious safety devices ever incorporated in a paper cutter.



Some of the advantages of the new Lawson "38" are:

(1) Measures 39 inch between uprights to handle conveniently the standard 38 inch paper width.

(2) Has a 6 inch clamp opening and easy treadle action. Closed knife bar slot prevents work spoilage.

(3) New and advanced automatic overload and non-repeat safety devices.

(4) Fully automatic clamp pressure adjustment control assures accurate cutting of every type of paper.

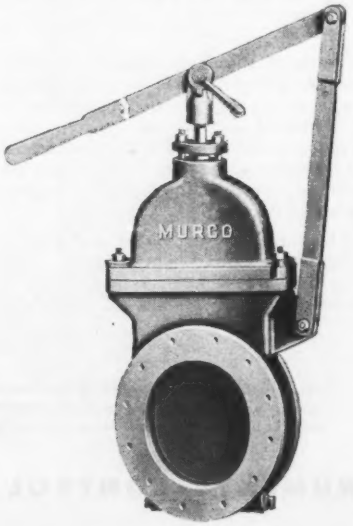
(5) Rugged in design — Working parts completely enclosed in cast metal frame of cutter; no sheet metal coverings to become loose and out of shape.

(6) Accessibility—Every working part and lubrication point is conveniently and quickly accessible.

The Lawson "44" and "50" Paper Cutters are now in the process of manufacture.

Murco Valve Handles Pulp Paper Stock On Low Pressure

Especially adaptable for handling pulp and paper stock and water under low pressure is the new "Murco" Quick Opening Gate Valve, manufactured by D. J. Murray Manufacturing Company, Wausau, Wisconsin. Made in all cast iron, cast iron with bronze gate, or all bronze, this valve is designed so that it is narrow from face to face of flanges that permits installation where space is limited, and it can be operated in a fraction of the time required for a screw valve. The gate is easily removed from the valve without disconnecting the valve from the pipe line, so that it is easily cleaned. Made in these sizes: 6, 8, 10, 12 and 16 inches.



Ross Now Building Mammoth Air System

The J. O. Ross Engineering Corporation reports that during the past year it has taken the largest number of orders for paper mill equipment of any year in its history. This exceptional volume of business is attributed to the fact that during this period there has been an exceptionally large number of new machines for which various types of Ross air systems were required.

During the past 12 months the records show that this company has put in 68 hood and exhaust systems, 78 heating and ventilating systems, 35 vapor absorption systems, 21 Ross-Grewin systems, and 97 other systems of various types, not to mention more than 400 sections of Ross briner economizers.

At the present time the largest Machine Ross air system ever installed is in the process of being manufactured. The Ross hood for this machine will be 355 feet long and 30 feet wide and will require the largest supply fan both in size and volume ever installed in a paper machine room.

In addition to the foregoing installations for the industry in the States, an impressive number of installations have been made and are on order for mills in Canada, South America, Mexico, Australia, etc.

New Lawson Multiple Head Drill-Slotter

It is claimed that the new Lawson Drill-Slotter will increase production over 30 percent. With one simple operation, it drills and slots two or more holes in a 2 inch lift of paper in less than 3 seconds.

This new Lawson Drill Slotter is easy to operate and set for required centers. It can also be used for drilling round holes only . . . changeover easily made. The iron table is in a fixed possition and its toe-tip treadle control brings the drills down to the work.

Actual machine operation shows that the heads are quickly adjustable from front of the table and spindles can be adjusted vertically while heads are in operation. Another feature is that chips are automatically carried to a removable refuse box in front of machine.

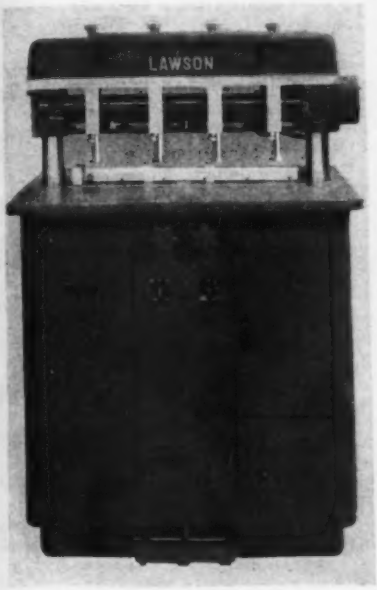
Other features include:

Fluorescent floodlight across front of machine, giving shadow-free illumination for setting heads and gauges; the back gauge is screw operation—riding in a V-slot—assuring absolute

squareness and is adjustable from front of machine. Its open frame gives unlimited back depth and all working parts are equipped with roller, ball or needle bearings.

Two models are available: the Lawson Multiple Head Drilling Machine and the Lawson Multiple Head Drill-Slotter.

The machines are now on display at the Lawson showrooms, 426 West 33rd Street, New York 1.

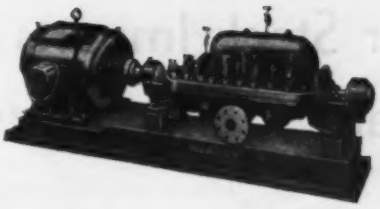


Warren Steam Pumps Efficient With Minimized Maintenance

Warren Steam Pump Company, Inc., Warren, Mass., has made a number of recent developments in its steam pump and equipment lines. The horizontal duplex piston steam pump "Realwear" type is now being supplied with important improvements. Adapted to boiler feed with pressures from 250 to 300 pounds, fuel oil pressure, oil transfer, general water service and a variety of other services and kinds of liquid. Molded piston cup packing, stainless steel durable valves, stainless steel piston rods and all steel valve gear (bronze brushed) are now standard features on these pumps, which are also available with Warren Pump and Receiver Sets. Bulletin 239 gives complete details specifications, capacities, dimensions, etc.

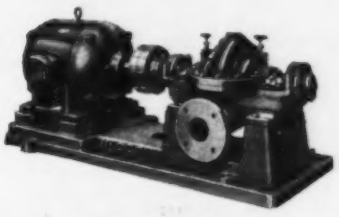
Machine Chest Pump

Features of the Warren Machine Chest Pump include duplex, angular contact thrust bearing, heavy duty radial ball bearing, large impeller passages for handling stock, impeller nonbinding, self cleaning type, renewable liners to protect costly parts against wear and propeller to maintain a practically constant pressure at eye of impeller. Available in sizes to handle up to 100 tons per day at the usual densities. One large paper manufacturer made a chart to test the constant, uniform delivery of Warren Machine and Jordan Chest Centrifugal Pumps. Reportedly the chart shows a 24-hour record of stock level in the regulating box, head in chest varied from 0 to 8 feet, yet practically throughout the entire test the Warren Machine Chest Pump is said to have maintained the regulating box level constant to a fraction of an inch!



Centrifugal Pump

Warren's single stage, double suction, type DBL Centrifugal Pump has a capacity of 50 GPM to 600 GPM. Maximum suction pressure, 75 PSI, maximum discharge pressure 125 PSI, hydrostatic test pressure, 200 PSI, maximum liquid temperature, 300 deg. F. Available in 1½, 2½, and 3 inch discharge sizes and left or right hand rotation. Bulletin 240 fully illustrates and describes this new addition to the Warren line.The bulletins mentioned above, and Bulletin 241 which describes Warren 4 and 6 stage pumps, may be obtained by writing to Warren Steam Pump Company, Inc. Warren, Mass.



Sandy Hill Iron & Brass Perfects Its Equipment

The demand for speed and conservation of space was probably the first incentive in the development of the Sandy Hill Selective Drive. The perfection of this drive provided the perfect answer to the first and most indispensable requirement of paper machine operators: an unvarying draw between sections.

Embodying the most modern ideas in power transmission, it provides a fineness of draw regulations and exact draw maintenance. These features are combined with simplicity, power saving and low first cost to a degree hitherto unknown.

These advantages result from the effective use of V-belts and variable pitch sheaves. The speed regulation provided by the variable pitch V-belt sheaves is beyond the range of other mechanical combinations.

Not to be overlooked in this drive application is the space requirement which is brought nearly to an inreducible minimum. No more is it necessary to take up valuable basement space or set a line shaft on an expensive structure of steel.

The simplicity of the drive operations brings its maintenance within the scope of the usual competent millwright present in every paper mill.

The Bertrams flow distributor, also a Sandy Hill specialty is now made in stainless steel. Since the first application of the designing principles in the Bertrams flow distributor it has been recognized as the most nearly perfect answer to smooth flow control. Each distributor is custom built to fit each machine, either fourdrinier or cylinder. A multiple manifold of precisely constructed passages assures convenience of distribution and uniformity of stock.

Every particle of stock flows exactly the same distance from the inlet pipe to its points of discharge on the apron board. This uniform delivery of stock assures several requisites a papermaker demands; paper of more even caliper; cockling due to formation reduced to a minimum; more uniform drying; predetermined amount of mixing of stock. The stock is discharged from the box in perfect condition for forming the sheet thus permitting a longer fibered sheet with a good formation.

Not least of the considerations to favor this type of headbox is a reduction in required space and cleaner operation. Now added to the inherent superior qualities of this design is its construction from stainless steel. The new stainless steel model pictured is one of three Sandy Hill built Bertrams Flow Distributors now in use in the mills of one of the country's leading paper manufacturers.

Whalings Take Over Glens Falls Plug Co.

CARTHAGE, N. Y.—George C. Whaling and his wife, Anna M. Whaling, chief factors of the Adirondack Core & Plug Company, Inc., have organized a new firm, the Glens Falls Plug Works, Inc., which also will have its offices in this village.

The new corporation, capitalized at $50,000, takes over the property and good will of the unincorporated Glens Falls Plug Works of the town of Queensbury and thereby doubles the activities and properties of the Whaling interests consigned to the manufacture of cores and plugs.

Cores and plugs are wood products used by paper mills in the preparation of rolls of paper for the market. With the Adirondack Core & Plug Company operating in the western slope of the Adirondacks and the Glens Falls company on the east slope, the Whaling interests will have a major interest in the core and plug business in New York State.

Paper and Paper Stock Imports At New York and Other Ports

NEW YORK IMPORTS

WEEK ENDING DECEMBER 21, 1946

SUMMARY

Newsprint .....11,863 rolls
Printing .....113 rolls, 114 cases
Miscellaneous Paper .....1 case

NEWSPRINT

Montmorency Paper Co., Inc., Wellington Park, Botwood, N. F., 5516 rolls.

News Syndicate Co., Colabee, Baie Comeau, 6347 rolls.

PRINTING PAPER

F. C. Strype, Inc., Edam, Rotterdam, 131 rolls, 114 cases.

MISCELLANEOUS PAPER

H. W. Robinson Co., Drottningholm, Gothenburg, 1 cs.

RAGS, BAGGINGS, ETC.

Continental Bank Trust Co., Exchange, Genoa, 93 bls. old jute bagging.

Order of Irving Trust Co., Exbrook, Alexandria, 219 bls. colored hessians.

E. J. Keller Co., Inc., Exbrook, Alexandria, 155 bls. cotton waste, 56 bls. canvas, 57 bls. hessian strips.

New England Waste Co., Marchen Maersk, Shanghai, 200 bls. cotton waste.

Padawer Co., Marchen Maersk, Shanghai, 589 bls. cotton waste.

Riverside Mills, Marchen Maersk, Shanghai, 1319 bls. cotton waste.

Kauders Steubers Co., Marchen Maersk, Shanghai, 100 bls. cotton waste.

C. Comiter Co., Inc., Marchen Maersk, Shanghai, 50 bls. cotton waste.

Schimmel Trading Corp. Mormacport, Rio de Janeiro, 213 bls. cotton waste.

O'Brien Products Inc., Hoegh Silverlight, Cochin, 500 bls. cotton waste.

Kauders Steuber Co., Hoegh Silverlight, Cochin, 125 bls. cotton waste.

New England Waste Co., Hoegh Silverlight, Cochin, 1000 bls. cotton waste.

Lush Cotton Products Co., Hoegh Silverlight, Cochin, 500 bls. cotton waste.

Volkart Bros. Inc., Hoegh Silverlight, Cochin, 1000 bls. cotton waste.

Schimmel Trading Corp., Hoegh Silverlight, Bombay, 184 bls. cotton waste.

New England Waste Co., Hoegh Silverlight, Bombay, 2185 bls. cotton waste.

Brandwein Mazur Co., Hoegh Silverlight, Bombay, 1820 bls. cotton waste.

Volkart Bros., Inc., Hoegh Silverlight, Bombay, 850 bls. cotton waste.

Lush Cotton Products Co., Hoegh Silverlight, Bombay, 600 bls. cotton waste.

E. J. Keller Co., Inc., Hoegh Silverlight, Bombay, 200 bls. old jute rags.

C. Comiter Co., Hoegh Silverlight, Bombay, 100 bls. cotton waste.

Castle & Overton, Inc., Hoegh Silverlight, Bombay, 280 bls. old jute rags.

Riverside Mills, Hoegh Silverlight, Bombay, 550 bls. cotton waste.

Camden Fiber Mills, Hoegh Silverlight, Bombay, 100 bls. cotton waste.

J. A. Mecloskey, Hoegh Silverlight, Bombay, 300 bls. cotton waste.

Padawer Co., Hoegh Silverlight, Bombay, 700 bls. cotton waste.

O'Brien Products Co., Hoegh Silverlight, Bombay, 181 bls. cotton waste.

Textile Paper Supply Corp., Hoegh Silverlight, Bombay, 63 bls. cotton waste.

Williamson Products Co., West Wind, Santos, 107 bls. cotton linters, 51 bls. cotton waste.

J. E. Brooks Cotton Co. (Montreal), West Wind, Santos, 125 bls. cotton waste.

Kauder Steuber Co., West Wind, Santos, 290 bls. cotton linters.

Chase National Bank, Cable Eye, Vera Cruz, 6 bls. wool rags.

State Street Trust Co., Cable Eye, Vera Cruz, 45 bls. wool rags.

Star Woolen Co., Santa Barbara, Valparaiso, 14 bls. worsted sweater clips.

E. J. Keller Co., Inc., Ogelthorpe Victory, Antwerp, 216 bls. old bagging.

Harbib Leonard & Co. Inc., Ogelthorpe Victory, Antwerp, 20 bls. wiping cloths.

Railway Supply & Manufacturing Co., Nonpareil, Shanghai, 100 bls. cotton waste.

Leigh Textile Co., Nonpareil, Shanghai, 100 bls. cotton waste.

Riverside Mills, Nonpareil, Shanghai, 500 bls. cotton waste.

Manufacturers Trust Co., Extavia, Genoa, 164 bls. old bagging.

A. W. Fenton Co., Extavia, Genoa, 139 bls. dark cottons.

Amicale Trading Co., Extavia, Leghorn, 152 bls. rags.

Manufacturers Trust Co., Extavia, Leghorn, 68 bls. cotton thread waste.

Brown Bros. Harriman & Co., Exhibitor, Madras, 78 bls, cotton waste pickers.

GLUESTOCK, ETC.

H. Remis & Co., Reuben Dario, Rio de Janeiro, 172 lbs. gluestock.

John Gorvers Co., Reuben Dario, Rio de Janeiro, 333 bls. gluestock.

H. Remis & Co., Mormacport, Rio de Janeiro, 173 bls. gluestock.

John Gorvers Co., Andalien, Valparaiso, 88 bls. dry split trimmings, 42 bls. dry pieces.

Darmstadt Scott & Courtney, Marine Flier, Manila, 108 bls. dry hide cuttings.

CASEIN

Sheffield Farms Co., Inc., Mormacport, Buenos Aires, 1000 bags lactic casein, 50,000 kilos.

Engenio Lang, Inc., Mormacport, Buenos Aires, 1757 bags casein, 105,429 kilos.

Aralac, Inc., Mormacport, Buenos Aires, 2000 bags casein, 100,000 kilos.

WOODPULP

Cellulose Sales Co., Drottningholm, Gothenburg, 923 bls. dry sulphite pulp, 177 tons; 955 bls. airdry sulphate pulp 194 tons.

Gottesman & Co., Inc., Goonawarra, Gothenburg, 583 bls. prime white dry ground wood 99 tons.

(———), Winthrop Victory, Toppila, 14,880 bls. prime unbleached kraft sulphite pulp.

Pulp Sales Corp., Winthrop Victory, Jakobstad, 11,660 bls. prime unbleached extra strong sulphite pulp; 2,545 bls. prime unbleached strong sulphite pulp; 920 bls. prime unbleached strong bleachable sulphite pulp.

BOSTON IMPORTS

Leigh Textile Co., Nonpareil, Hong Kong, 100 bls. cotton waste.

PHILADELPHIA IMPORTS

Castle & Overton, Inc., Ogelthrope Victory, Antwerp, 49 bls. rags.

(———), Winthrop Victory, Toppila, 650 bls. prime unbleached kraft sulphite pulp.

OBITUARY

Fred Lamon

WATERTOWN, N. Y. — Fred Lamon, 72, of Dexter, veteran paper mill employe, died suddenly of a heart attack in his home recently. He was the oldest employe of the Dexter Sulphite & Paper Company in point of years of service and had been with the company for 55 years. At the time of his death he was a beater engineer.

He entered the employ of the company at the age of 17. Starting as an engineman and later became beater engineer. Mr. Lamon was vice-president of Local No. 64, Papermakers' Union, at the time of his death.

He is survived by his wife and seven children. Mr. and Mrs. Lamon would have celebrated their golden wedding anniversary next June.

William C. Higgins

FRAMINGHAM, Mass. — William C. Higgins, 52, of 23 Warren Road, a division manager of the Dennison Manufacturing Company, died suddenly December 11. He was an athlete at Framingham High School and was graduated from Norwich University where he played varsity football.

A veteran of World War I, he served overseas with the 302d Machine Gun Battalion. During World War II, he served on local Red Cross committees. He was a high school football official.

Week's Record of Trends in The Pulp and Paper Market

Office of the PAPER TRADE JOURNAL,
Tuesday, December 24, 1947.

With the announcement by the International Paper Company of an increase in the price of kraft liner board from the present level of $84 a ton to $100 a ton, effective January 1, 1947, we have the first definite trend in the future price structure of the paper industry. The price of this board, which is in heavy demand by manufacturers of solid fiber and corrugated containers for outer and inner facings, was increased $10 to its present $84 price in November, effective the first of this month. This new increase, according to company officials, has been forced by the need of meeting increased costs. During 1945, International Paper produced 874,163 tons of kraft liner board. Total domestic production in 1945 amounted to 4,075,400 tons. Meanwhile, West Virginia Pulp and Paper Company has indicated that its price for kraft liner board would continue at $84 at least for the month of January. All other major producers of this particular type of board, including National Container Co., Chesapeake Corp., Union Bag and Paper, Brown Paper Mills Co., and Gaylord Container, report that they have not yet determined what changes, if any, they will make in their prices.

Puget Sound Pulp and Timber Company reports earnings for the third quarter of $1.29 a share on its 326,940 common shares outstanding. This compares with 96 cents a share for the entire first half of 1946. Output has made a steady gain this year, with third quarter production 4,000 tons greater than in the second quarter, and 8,000 tons over the first three months of 1946. Annual rate of production, however, is still about 25,000 tons short of the company's 125,000 ton capacity. Company officials attribute the increased earnings to increased pulp production, the proration of fixed charges over larger output, operation of a recently completed cost-saving barking and chipping plant and a 10 percent boost in the sales price of pulp. The company, which produces unbleached sulphite wood pulp, is building up a log inventory for the winter.

The firm's future is bright, according to company officials, with the demand for its products, which include industrial alcohol made from waste sulphite liquor continuing to exceed supply. The company expects to benefit in the fourth quarter from the higher prices now being received for pulp. While competition from foreign countries may increase a little, it is not expected to be too much of a factor in the present tight supply situation. . . . Sales of Hinde and Dauch Paper of Canada this year are expected to exceed those of 1945, according to company reports. Tonnage deliveries may also exceed their previous peak. However, raw material supplies are still a problem. The firm imported about 10 times as much paper stocks in the first 9 months of this year as it had in any previously similar period.

Completion of a one million dollar expansion program at the Masonite Corporation's Laurel, Mississippi, plant has been delayed by difficulty in securing equipment. Every effort, however, is being made to have the new facilities in operation about the first of the year. This will increase the plant's output by 30 percent. The company will also invest $220,000 in the common stock of a new hardboard and insulation board plant which will be constructed in the Union of South Africa by local people. Masonite Corporation will furnish engineering services and give trade mark rights to the African company, for which it will receive a substantial amount of additional common stock. Expansion plans have also been announced for two other foreign plants in which Masonite Corporation has financial interests. These are the Masonite Corp., Ltd. of Australia and the Masonite Co., of Canada Ltd.

The index of general business activity for the week ended December 14 rose to 141.6 from 136.6 in the previous week, compared with 131.9 for the corresponding week in 1945. The index of paperboard production remained 176.4 from 176.4 in the previous week, compared with 158.5 for the corresponding week in 1945.

Paper production for the week ended December 14 was estimated at 106.7 per cent, compared with 106.6 for the preceding week, with 99.0 for the corresponding week in 1945, with 89.3 for 1944, with 89.9 for 1943, and with 87.9 per cent for the corresponding week in 1942.

Paperboard production for the week ended December 14 was 102.0 per cent of capacity, compared with 99.0 per cent for the preceding week, with 98.0 for the corresponding week in 1945, with 94.0 for 1944, with 96.0 for 1943, and with 85.0 per cent for the corresponding week in 1942.

Wood Pulp

Wood pulp supplies in this country will continue short at least until July, trade sources report. While the United States and Canadian mills continue to produce at record levels, greater quantities of pulp are still in demand. Additional supplies from Swedish mills cannot be expected before the second half of 1947, because of the materials shortages in that country. Swedish pulp producers are said to be in particular need of chemicals and coal.

Rags

New cotton cuttings continue in heavy demand with fine paper mills paying top prices for most all quality grades. Domestic white cotton shirt cuttings are reported at $10.50 per 100 pounds delivered mill plus dealer's commission. Cottonades are taken up at $4.50; unbleached muslin at $11 and light percales at $5.50.

Roofing rags are active at $2.50 per 100 pounds for the No. 1 grade; $1.85 for No. 2 grade and $1.65 for jute bagging. Repacked old domestic thirds and blues are currently $3.

Old Rope and Bagging

Market for old rope continues steady with foreign Manila reported 6 to 7c per pound, and domestic at 5.75c. No. 1 sisal strings are firm at 4.00 to 4.50c; jute strings 4.50 to 5.00c.

Bagging market remains fairly steady with paper mills taking up domestic No. 1 gunny at the $4.25 to $4.50 level, and paying $4.75 to $5 for foreign gunny. Bright bagging continues $4.25 to $4.50.

Waste Paper

Paper mills continue their strong bidding for high grade waste paper with the result that some quotations seem to be headed for the bright blue yonder. Most quotations, however, maintain a fairly steady position at recent levels. Sales of hard white cuttins were reported variously from $110 to over $125 per ton for No. 1, one cuts.

Paper Group Guests Enjoy Xmas Party

CHICAGO—Nearly two hundred members and guests of the Professional Paper Group including many women thoroughly enjoyed the annual Christmas party held in the dining rooms of the Chicago Bar Association on Monday evening, December 16. An informal friendship hour preceded the most excellent dinner following which President Long, Container Corporation, took little time in turning the entire program over to Herb Vogel of the Ace Carton Corporation who acted as master of ceremonies. Back of the M.C.'s current performance were years of experience professionally and he outdid himself, according to report, in keeping everyone in good humor and in presenting the long list of entertainers including the ever popular musical strollers who aided in getting everyone to sing his or her favorite song. The entertainment program then featured trick artists, songsters, magicians and other professionals who did their part to make the evening an outstanding success.

It was reported that the Group would "get back to business" in January with a panel discussion on some important subject yet to be announced.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Tuesday, December 24, 1946.

BLANC FIXE — Demand reported active with raw materials still tight. Pulp is currently quoted at $40 per ton, in barrels, car lots, at works; the powder is currently quoted at $60 per ton, car lots, f.o.b. works.

BLEACHING POWDER — Supplies reported adequate to meet demands although there is some delay in current shipments. Quotations are unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots at works.

CASEIN—Current prices on processed acid precipitated casein are reported around 46 to 52 cents per pound for both domestic and Argentine grades; f.o.b. shipping point, with quantity not specified at the present time. Supplies are expected to increase at the year's end.

CAUSTIC SODA—Supplies tightest ever at market remains critical. Shipments are behind schedule. Cutback production further reduces stocks. Solid caustic soda is reported at $2.30 per 100 pounds; flaked and ground offered at $2.70 to $2.95 per 100 pounds. All prices car lots.

CHINA CLAY—Supplies are becoming tighter as demand continues to increase. Quotations remain unchanged. Domestic filler clay is currently quoted at from $8.50 to $9 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $22 to $25 per long ton, ship side. All prices quoted in car lots.

CHLORINE — Demand continues to exceed output, market tight, stocks low. Lack of tank cars continues to hamper deliveries. Quotations unchanged. Chlorine is currently quoted at $2 to $2.25 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Gum rosin in drums, per 100 pounds net, in yard New York, car lots, B, D, E, $8.35; F, G, H, I, K, M, N, WG, $8.55; WW, $8.65. Wood Rosin, per 100 pounds, l. c. l., f.o.b. N. Y., B, $6.35; FF, $7.35; G, H, I, $8.35; WW, $8.55. Business is brisk, with more and more export licenses arriving from Washington.

SALT CAKE — Demand increasing with supplies showing some improvement. Prices remain unchanged. Domestic salt cake is quoted at $15 per ton in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots f.o.b. shipping point.

SODA ASH—Supplies continue short, demand active, previous orders filled. Contract orders for 1947 heavy. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.95; in paper bags, $1.05; and in barrels, $1.35. This market is not expected to ease up before June, 1947.

STARCH—Supplies are showing steady improvement. Previous orders filled. Starch prices continue to drop. The pearl grade is quoted at $3.62 per 100 pounds; powdered starch at $3.73 per 100 pounds; both prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand active, supply fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.20 per 100 The pearl grade is quoted at $3.62 per 100 pounds; powdered starch at $3.73 per 100 pounds; both prices in at works.

SULPHUR—Strong seasonal demand is reported with stocks plentiful to meet all requirements. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $20.00 per long ton. All prices in car lots.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.

MARKET QUOTATIONS

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done, under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$84.00	@	—
Sheets	103.00	"	—

Kraft—per cwt.—Carload Quantities Zone A, Delivered

Superstandard Wrapping	*$5.75	@	$6.00
No. 1 Wrapping	*5.50	"	5.75
Standard Wrapping	*5.25	"	5.50
Standard bag	*5.25	"	5.50

* Prices for Standard Wrapping are for 40 lb. base weight; for Standard Bag for 30 lb. base weight.

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.10	@	1.20
Wh. No. 1 M. G.	1.10	@	1.20
Wh. No. 1½	.95	@	1.10
Wh. No. 2	1.00	@	1.10
Wh. Anti-Tar.	2.25	@	3.50
Kraft Unbl.	1.15	@	1.25
Manila No. 2	.90	@	1.05

Toilet—Per Case of 100 rolls 1 M Sheets.

Unbleached	4.47	@	5.50
Bleached	6.50	"	—

Paper Towels — Per Case of 3750 Zone 1.

Wh. C. fold 11x13½	4.09	@	—
Br. Sgl. fold 10 in.	2.37	"	2.48
Br. M'tif'd 9½x14¼	3.48	"	—
Br. M'tif'd 9½x9¼	2.37	"	2.48

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	*70.00	@	75.00
Chip	*67.50	"	73,00
Sgl. Mla. Ll Chip	*80.00	"	89.00
White Pat. Coated	*86.00	"	101.50
Kraft Liners 42 lb.	*84.00	"	100.00
Binders Boards	94.00	"	126.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5. regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2 50; basis 101-120, add $5.

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.75@$46.75	$40.90@$48.00
100% Rag.	32.85 " 38.50	34.00 " 40.00
85% Rag	.... "	30.55 " 38.75
75% Rag	24.30 " 28.50	24.45 " 30.00
65% Rag	.... "	.... " ....
50% Rag	20.05 " 24.50	21.25 " 25.75
25% Rag	17.85 " 21.75	19.00 " 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers.. White, Assorted Items

	Bonds	Ledgers
No. 1	$12.00@$14.50	$13.15@$16.00
No. 2	11.25 " 13.75	12.25 " 15.00
No. 3	.... "	.... " ....
No. 4	10.60 " 13.00	11.75 " 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

No. 1 Glossy Coated..	$14.70@	$16.75
No. 2 Glossy Coated..	13.75 "	15.30
No. 3 Glossy Coated..	13.20 "	14.80
No. 4 Glossy Coated..	12.80 "	14.30
No. 1 Antique (Watermarked)	11.35 "	12.75
No. 2 Offset	10.65 "	12.25
A Grade E. F.	10.60 "	12.00
A Grade S. & S. C.	11.00 "	12.50
B Grade E. F.	10.30 "	11.75
B Grade S. C.	10.70 "	12.25
C Grade E. F.	10.00 "	11.50
C Grade S. C.	10.40 "	12.00
D Grade E. F.	9.70 "	11.00
D Grade S. & S. C.	10.10 "	11.50

Ivory & India at $.50 cwt. extra.

Wood Pulp

Domestic mill prices delivered with usual OPA freight allowances.

	Per Short Ton
Southern Kraft	$89.00
Soda	115.00
Bl. Sulphite	115.00

Canadian mill prices delivered with freight allowances of $7.50 per ADT; unless otherwise specified:

	Per Short Ton
Regular Kraft	$95.00@$97.50
Select Unbleached Kraft (no freight allowance)	99.00 " —
Unbleached Sulphite	100.00 " —
Glassine Unbleached Sulphate (no freight allowance)	90.00 " —
Bleached Soda	110.00 " —
Groundwood	70.00 " 75.00
Sideruns Pulping News	74.00 " —
Hardwood and Specialty Grades	Nominal

Swedish wood pulp prices, per ton of 2,000 lbs. air dry weight on dock usual Atlantic and Gulf ports with an average freight cost of about $9.00 per short ton included. Subject to change as it is said these prices are not satisfactory to Swedish producers:

	Per Short Ton
Bleached Sulphite	$120.00
Bleached Kraft	126.00
Unbleached Sulphite	95.00
Unbleached Kraft	89.00

Finnish quotations f.o.b. shipping point

	Per Ton
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

Other European countries, at the present time, are not quoting on prompt and forward deliveries of wood pulp, because they have no tonnage available for export.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

Finnish quotations f.o.b. shipping point

White Shirt	$10.50
Light Silesias	7.50
Unbleached Muslin	11.00
White Back Blue Overalls	8.25
Blue Overalls	7.75
Unbl. Fancy Shirt	4.50
Light Percales	5.50
Light Prints	5.25
Washables	4.00
Blaechable Khaki	5.50
Unbleachable Khaki	5.00
Cottonades	4.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.00
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.85
No. 2 Roofing Rags	1.75
No. 3 Jute Bagging	1.65
No. 4 Brussels and hard back carpets	1.65
No. 5A Roofing Rags	1.65

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to ....
New Mixed Cuttings	6.50 " ....
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	4.50 " 5.00
Dark Cottons	3.75 " 4.00
Old Shopperies	3.25 " 3.50
New Shopperies	3.25 " 3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " ....
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	4.00 " 4.50
Mixed Strings	1.75 " ....

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00 @ $110.00
No. 1 Hard White Envelope Cuts	85.00 " 100.00
No. 1 Hard White Shavings, unruled	100.00 " —
No. 1 Hard White Shavings, ruled	80.00 " 90.00
Soft White Shavings, one cut	85.00 " 90.00
No. 1 Soft White Shavings	75.00 " 80.00
Soft White Shavings, Misc.	65.00 " —
No. 1 Fly Leaf Shavings	40.00 " —
No. 2 Fly Leaf Shavings	(nominal)
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings	(nominal)
Overissue Magazines	(nominal)
No. 1 Heavy Books & Magazines	38.50 " —
Mixed Books	22.00 " 25.00
No. 1 White Ledger	50.00 " 52.00
No. 2 Mixed Ledger, colored	40.00 " 45.00
New Manila Envelope Cuttings, one cut	65.00 " 75.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	(nominal)
Mixed Kraft, Env. & Bag Cuttings	70.00 " —
Kraft Envelope Cuttings	80.00 " 85.00
Triple Sorted, No. 1 Brown Soft Kraft	55.00 " —
New 100% Kraft Corrugated Cuttings	55.00 " 60.00
No. 1 Assorted Old Kraft	40.00 " —
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	(nominal)
Box Board Cuttings	23.00 " —
White Blank News	45.00 " —
Overissue News	35.00 " —
No. 1 News	25.00 " 26.00
No. 1 Mixed Paper	19.00 " 21.00
Old Corrugated	28.00 " 30.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—	
India	.26 @ —
White Hemp	.26 " —
Fine Polished—	
Fine India	.31 " —
Unpolished—	
Box	.20¼ " —
Paper Makers	.20 " —
Tube Rope	.22 " —
Wall Paper	.23½ " —
Wrapping	.26 " —
Soft Fiber Rope	.22 " —
Cotton	.28 " —
(Hard Fiber)	
Medium Java	.23 " —
Mex. Sisal	.21 " —
Manila	.33 " —

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—Acording to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	to	4.00
Mixed White	3.50	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	2.50
Repacked	2.20	"	—
Roofing Stock—			
Foreign No. 1	1.85	"	—
Domestic No. 1	1.75	"	—
Domestic No. 2	1.65	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	to	3.50
No. 1 Clean Bright—			
Sisal Strings	.04	"	—
No. 2 Clean Bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.85
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

Mill Prices, Baled

No. 1 Hard White Shavings, unruled	5.00	@	6.00
No. 1 Hard White Shavings, ruled	5.00	"	6.00
Soft White Shavings, Mis.	5.00	"	6.00
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.75	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	3.25	"	—
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	—	"	3.00
No. 1 Mixed Paper	—	"	.95
Overissue News	—	"	1.25
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	—	"	1.40
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	5.00	@	—
Domestic	5.25	"	—
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.50	"	—
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	5.50	"	6.00
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.06	@	.06½
Fancy Percales	.04¼	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.09½	"	.10
Canton Flannels, Bleached	.06	"	.06¾
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¾
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.11½	"	.12
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.06	"	.06¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.11½	"	.12

Domestic Rage (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings unruled	2.87	"	—
No. 1 Soft White Shavings	1.90	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Bag	1.35	"	—
No. 1 Roofing Bag	1.45	"	—

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

W. L. Cook, Editor

Alaskan Dreamland

The for the moment exciting news that Alaska may turn some of its resources into paper production soon is to be considerably discounted. Both in the paper industry and in government agencies there are those who recite the many things manufacturers would need, such as adequate transportation, power and housing. There are said to be not yet available.

The territory is reported suffering from a severe housing shortage caused by lack of building materials and not too great an amount of available man power. Property is reported costly and as far as power is concerned, local sources know of no adequate hydroelectric plant in the southeastern part of Alaska where the timber lands are located. Congress, faced with the necessity of balancing a budget and of trimming taxes, will have to look with favor on other things than granting huge sums necessary to get paper production into full blast no matter how much it is needed. The dream of big paper production is not a new one for residents of Alaska who are said to have been waiting for years for paper manufacturers to come along and take advantage of the vast timber resources which, it is estimated, could supply one quarter of this country's total newsprint demands. There is a widespread belief, however, that the continued shortages in the newsprint industry and in the paper trade in general will cause much more attention to be focused on the Alaskan situation. As one paper executive put it, "Congress and the people rarely get excited about new developments until the need is so apparent as to cause them real concern. That need has certainly become apparent recently. Maybe it will cause a cutting of red tape and a series of steps which will make it possible for the paper trade to develop this territory."

Reverse Circulation

To that ardent and outspoken spokesman for the newspaper point of view about the paper shortage a bow must be accorded for the emphasis which it has placed behind a suggestion that the papers themselves can do something constructive about the newsprint shortage. At least the help they could render would be partly effective, it is argued, and certainly the effort would be worth the trial, if it turned up the fact that large tonnages of used newsprint still are finding their way to destruction instead of into accustomed channels of collection. Briefly, the newspaper presents the suggestions that circulation staffs be put into reverse, after their delivery problems have been attended to, and that they be charged with a quota of fifty per cent of their deliveries to be collected and turned back by the papers to the mills for reprocessing.

The mills in Canada and the United States, the Chicago Tribune declares, are expected to turn out more newsprint next year than ever before, but the supply will be inadequate even though the machinery be used to capacity. Building new mills will not solve the problem wholly, because available timberlands that supply pulpwood are also limited. Pending the development of other raw materials than the spruce and balsam now largely used for groundwood pulp in newsprint, the only relief in sight to the writer is more efficient use and particularly re-use, of available materials. It is estimated that only half of the newspapers sold get back to the mills for reworking. Used newsprint can be and is used in making a wide variety of paper products. If manufacturers of these products can buy scrap paper, they don't have to invade the woodpulp market for materials. Newspaper delivery facilities will work in reverse.

The Woodsman Speaks Up

It was almost too bad that Vernon E. Johnson, in deference to his audience, had to insert a sentence or two between those in which he described his job and his responsibilities in an address before the Kinsmen Club at Montreal last month. For, along with his statement, "My job is to cut down trees," the vice-president of the Canadian International Paper Company went on to describe the woodlands manager's problem, which is that of the entire paper industry. "I have to hold my job by delivering the goods," he went on. "And my goods consists of pulpwood delivered at our mills. The mills must depend for wood on the limits I manage, not only this year and next, but in perpetuity."

The forest situation, he admitted, does not give cause for concern. In the first place, the critcal point in the utliization of the Canadian forests appears to be approaching. The nanual consumption will shortly balance regrowth. And secondly, the fear of those who work in the bush is that circumstances beyond our control may nullify our efforts to provide annual wood harvests in perpetuity for the pulp and paper mills. These circumstances consist of but one

Calendar of Coming Events

January 29-31, 1947 — Canadian Pulp and Paper Association, Annual Meeting, The Mount Royal, Montreal, P. Q.

January 29, 1947—Southern Pulpwood Conservation Association, Annual Meeting, The Ansley Hotel, Atlanta, Ga.

February 23-27, 1947—The American Paper and Pulp Association, Annual Meeting, The Waldorf-Astoria, New York City.

February 24-27, 1947—Technical Association of the Pulp and Paper Industry, Annual Meeting, The Commodore, New York City.

thing: bugs, namely, insects and fire bugs. They jointly account for 27 per cent of our annual forest depletion. Those who chop for our pulp and paper mills account for less than 17 per cent of the annual depletion. The remainder is chiefly used for lumber and fuelwood.

There is reason to worry about the fire and insect hazards. The spruce budworm plague has reached epidemic proportions. Some 22,000 square miles of forest have been devastated and the lumber partially destroyed. This epidemic is now present in roughly one-third of the accessible productive forests of the nation. With fire, no less than 60 per cent of the original forest has been burned—only 13 per cent has been cut for use. Such figures speak for themselves. They speak the more forcefully because they are Dominion Government figures.

To those, everywhere, who would conserve by severe restriction, he closed a thoughtful analysis of the woods problem with a counter-thought that turns the other side of the picture. "It is essential," he reminded his audience, "that the public become imbued with the need of developing and implementing a national forest policy providing a greater annual harvest and a greater annual increment, an increment adequate to meet the forest needs of Canada for all time, an increment which to the tradesman would mean only more gold in the till, but which to Canadians would mean a way of life revealing to all that we are not unworthy of the abundance which God has bestowed on this fortunate land."

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1046		Corresponding Weeks—1945	
November 9	106.8	November 10	97.0
November 16	104.9	November 17	96.4
November 23	106.6	November 24	91.4
November 30	103.0	December 1	97.5
December 7	106.6	December 8	99.0
December 14	*106.7*	December 15	99.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	91.0	89.7
1946	94.7	98.4	104.4	102.7	100.7	104.6	94.0	104.7	101.3	106.4	*105.5*		

COMPARATIVE YEARLY SUMMARIES

	1939	1940	1941	1942	1943	1944	1945	1946
Year to Date	83.4	86.0	97.4	91.3	88.5	88.7	89.9	*101.7*
Year Average	83.4	85.6	97.4	90.4	87.8	88.1	89.7	

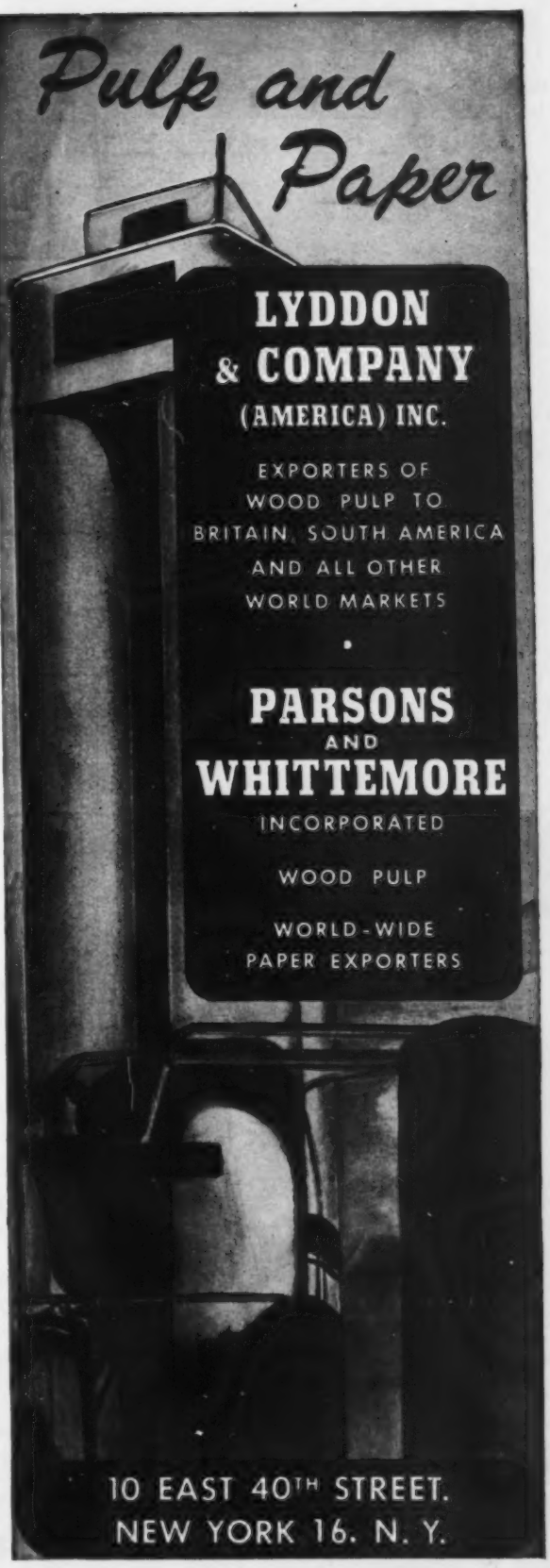
PAPERBOARD OPERATING RATIOS†

Current Weeks—1946		Corresponding Weeks—1945	
November 9	102	November 10	97
November 16	101	November 17	95
November 23	100	November 24	91
November 30	94	December 1	96
December 7	99	December 8	97
December 14	*102*	December 15	98

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	91	95	97	97	96	96	86	90	91	97	95	95	93
1946	90	97	100	99	94	97	89	99	96	100	99		

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.



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The Fatty Acids in Tall Oil

A Literature Review

By B. L. Browning[1] and John B. Calkin[2]

Abstract

The literature pertaining to the composition of the fatty acids present in tall oil are reviewed. It is concluded that analytical examination of these components is not sufficiently complete, although desirable, because of their effect on prospective applications of tall oil.

A number of analyses of tall oil, obtained as a by-product in the sulphate pulping of wood, have been reported. However, the results obtained frequently are conflicting, and the composition of the fatty acid portion has not been well established.

Obviously, different tall oil specimens may vary radically in composition, depending upon the species and degree of seasoning of the wood, upon the pulping conditions, and upon the mode of separation and subsequent treatment of the tall oil. Other reported differences in composition may be attributed to the different means of separation of the component fatty acid groups and to differences in the nature of analytical methods employed.

The precise analysis of tall oil presents many difficulties not encountered in the usual procedures of oil and fat analysis. After the necessary removal of nonfatty wood extractives, the fatty acid fractions in part represent altered materials for which complete and accurate analytical methods have not been established. Thus, the unsaturated fatty acids, representing the chief portion, have been subjected to strong alkali at high temperatures, and the acids originally present in the wood have been modified in a number of ways to yield products not present in the original wood.

The various analyses of tall oil which have been reported are summarized in Table I.

Discussion

It may be expected that the fatty acids originally present in the wood will appear in the tall oil, although not necessarily in the same proportions because of different solubility relationships and alterations during the cooking procedure.

According to Kurth *(13)*, the usual saturated fatty acids in wood are stearic and palmitic, although several lesser known acids have been reported. The unsaturated acids are oleic, linoleic, and linolenic. An analysis of pinewood indicated that the unsaturated acids were oleic and linoleic in approximately equal amounts. Actually, very few analyses of fatty acids in wood, particularly in the species used for pulping, have been reported.

The frequent report of palmitic acid in tall oil, whereas stearic acid appears to be more common in wood, has occasioned some speculation. However, it has been shown that oleic acid in the presence of alkali at elevated temperature is partially converted to palmitic acid *(14)*. Hence, it seems that there can be little doubt that the presence of a part of the palmitic acid in tall oil can be explained on this basis.

The presence of conjugated linoleic acid in tall oil may cast some doubt on the exactness of the Kaufmann method as applied to tall oil, because, as Anderson and Wheeler have pointed out, the iodine and thiocyanogen values of conjugated linoleic acid have not been established. However, in view of the agreement found by these authors in a comparison of the spectrophotometric and the Kaufmann method, the error cannot amount to more than a few per cent.

It is worth emphasizing that a part of the lack of information on tall oil composition is caused by the deficiency in available analytical methods. In general, the methods employed prior to 1927 were inadequate to provide more than rough qualitative indications of composition and only the relatively few investigations since that time can be taken to have any great degree of reliability. Even the later work has necessarily applied methods which are not adequate to define accurately the composition of the fatty acids, and the complete and precise analysis of all components is a major undertaking which will, ideally, require methods more refined than any which have yet been developed.

However, there seems little doubt that the chief portion of the tall oil fatty acids are unsaturated, and that oleic and linoleic acids predominate. The data on saturated acids are so conflicting that no conclusions can be drawn. It seems probable that small quantities of both saturated acids and unsaturated acids other than oleic and linoleic may be present, at least in some specimens of tall oil.

If the nature and quantity of the minor constituents are such as to influence prospective application of tall oil fatty acids, it would seem desirable and necessary to determine more accurately, and for a wider variety of specimens, the exact composition or range of composition which may be expected. The same comments may be applied to altered acids, such as hydroxy acids and conjugated acids. Despite the excellent recent work of Anderson and Wheeler, it seems reasonable to state that the composition of tall

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[2] Co-ordinator of Research, Union Bag & Paper Corp., New York, N. Y.

TABLE I.—ANALYSIS OF FATTY ACIDS IN TALL OIL

Author	Source of Tall Oil	Method of Analysis	Saturated Acids (Percentage on basis of total fatty acids)	Unsaturated Acids (Percentage on basis of total unsaturated acids)			
				Oleic	Linoleic	Linolenic	Other
Bergström(*1*)	Swedish	Tall oil fractionally distilled. Palmitic by recrystallization of distillate. Oleic by eliadin reaction; linoenic by hexabromide. No tetrabromide formed.	palmitic	present	absent	present	.....
Hasselström(*2*)		Fractional distillation of esters. Saturated acids by lead salt-ether. Oleic and linoleic acids by ozonization. Linolenic acid by hexabromide.	palmitic	principally	some	small quantity	.....
Dittmer(*3*)		Lead salts soluble in ether. Oleic and linoleic acids by $KMnO_4$ oxidation to di- and tetrahydroxystearic acids. Linolenic acid by hexabromide.	absent	present	present	present	.....
Keghel(*4*)	Swedish	Not described (fat consists largely of liquid fatty acids).	lauric, myristic, palmitic	.....	.....	present	talloleic
Pyhälä(*5*)	Finnish	Fractional distillation with steam. Unsaturated acids determined from permanganate oxidation products.	palmitic (not over a few per cent)	present	present	present	ricinoleic, erucic, or brassidic
Sandqvist, Gorton and Bengtsson(*6*)	Not stated	Method of isolation not described. Identification based on melting point, carbon and hydrogen, equivalent weight, and melting point of methyl ester.	lignoceric ($C_{24}H_{48}O_2$)	.....	.....	.....	.....
Niesen(*7*)	German	Lead salts soluble in ether. Unsaturated acids by iodine-thiocyanogen. Oleic and linoleic confirmed by $KMnO_4$ oxidation to hydroxy acids; linolenic by hexabromide test. Also spectrophotometric examination.	absent	22.7% (18%)*	71.3% (80%)*	6.0% (1%)* (0.95% from hexabromide test)	.....
Alford(*8*)	Not stated, probably American	Not described.	absent	43.6%	19.9%	36.5%	.....
Sandström and Sandström(*9*)	Swedish (2 specimens of "normal" tall oil)	Saturated acids by Bertram $KMnO_4$ method. Unsaturated acids by iodine-thiocyanogen.	4.8% total	43.4%	50.0%	6.6%	.....
Max(*10*)	American (laboratory cook)	Lead salt-ether.	4.7% total (green wood) 2.7% total (seasoned wood), stearic indicated by melting point	.....	.....	.....	oxidized acids present (insoluble in petroleum ether)
Anderson and Wheeler(*11*)	American (6 specimens)	Spectrophotometric. Confirmed by iodine-thiocyanogen with good agreement. Saturated acids by low temperature acetone method and by difference. Distillation of esters on one specimen.	7%, principally palmitic	51.6%	48.4% (including 12% conjugated linolenic acid)	absent	Acids higher than C_{18} indicated. Palmitoleic acid indicated
Bergström(*12*)	Not stated, presumably Swedish	Identification based on melting point of acid and its methyl ester.	$C_{24}H_{48}O_2$, probably carnaubic				

* Using revised empirical constants(*11*).

oil has not yet been given as rigid and searching an examination as has been applied to certain other vegetable fats of natural origin. In this respect, it is an unfortunate circumstance that the variability in composition of tall oil is probably much greater than in the case of fats extracted directly from plant materials.

Literature Cited

1. Bergström, Hilding, *Jern-Kontorets Ann.*, Bihang 12: 507-518 (1911).
2. Hasselström, T., *Finnish Paper Timber J.* 7: 632-634, 636-638 (1925); *Paper Trade J.* 83, No. 2: 60-64 (July 8, 1926).
3. Dittmer, M., *Z. angew. Chem* 39: 262-269 (1926).
4. Keghel, M. de, *Rev. chim. ind.* 75: 170-173, 202-206 (1926); *Pulp Paper Mag. Canada* 26: 529-531, 546-548 (1928).
5. Pyhälä, E., *Svensk Papperstidn.* 29: 601-604, 627-629 (1926).
6. Sandqvist, H., Gorton, J., and Bengtsson, E., *Ber.* 64: 2172-2174 (1931).
7. Niesen, H., *Fette und Seifen* 44, No. 10: 426-432 (1937); 47, No. 7: 296-301 (1940).
8. Alford, Edwin C., Official Digest, Federation of Paint and Varnish Production Clubs No. 213: 66-74 (Feb., 1942).
9. Sandström, G., and Sandström, Margareta, *Svensk Papperstidn.* 47, No. 16: 381-386 (August 31, 1944).
10. Max, Keith W., *Southern Pulp Paper J.* 7, No. 8: 9-13, 28, 30, 32; No. 9: 22-24, 26, 28 (Jan., Feb., 1945).
11. Anderson, R. H., and Wheeler, D. H., *Oil and Soap* 22, No. 6: 137-141 (1945).
12. Bergström, Hilding, and Trobeck, Karl, *Svensk Papperstidn.* 48, No. 12: 302 (June 30, 1945).
13. Kurth, E. F., in Wise, Louis E., Wood Chemistry, New York, Reinhold, 1944.
14. Hasselström, T., *Paper Trade J.* 85, No. 1: 49-53 (July 7, 1927).

Cellulose in Wood*

TAPPI Tentative Standard T17m-46

The procedure here described isolates the total cellulose in wood by a process of chlorination. The cellulose thus obtained is sometimes referred to as Cross and Bevan cellulose. As the method is empirical, details must be carefully followed.

Apparatus

1. *Chlorinated Apparatus.* A special chlorination apparatus as illustrated in Fig. 1 is required for this determinaiton. It consists of one leveling tube and holder, two individual glass three-way stopcocks, one thermometer, one Hempel precision gas buret fitted with a three-way stopcock, a glass water jacket for the gas buret, and a Hempel gas pipet.

2. *Glass Crucibles* of about 40-ml. capacity, equipped with a fritted glass bottom of medium porosity (Pyrex M, or equivalent).

3. *Alundum Crucibles* of about 40-ml. capacity and of porosity R.A. 98.

Reagents

A. *Alcohol-benzene.* A mixture of 33 volumes of approximately 95% ethyl alcohol and 67 volumes of C.P. benzene.

B. *Calcium Chloride Solution for gas buret and gas pipet.* Saturate water with $CaCl_2$ at room temperature, bubble chlorine gas in until saturated, and filter for use. When the apparatus is not in use it is well to have it filled with fresh Cl gas, thus keeping the $CaCl_2$ solution saturated.

C. *Chlorine,* in a tank or cylinder under pressure.

D. *Sulphur Dioxide Solution,* approximately 3%. Pass a stream of SO_2 gas into 100 ml. of distilled water at about 25°C. (77°F.) until saturated. Then dilute with 200 ml. of distilled water at the same temperature. (This should give approximately a 3.1% solution if prepared at 25°C.; 2.6% at 30°C.; and 3.8% at 20°C. The exact strength is not important, but since there is a tendency toward low strength due to possible incomplete saturation, it is preferable not to have the temperature much above 25°C.)

E. *Sodium Sulphite Solution, 2%.* Dissolve 20 grams of anhydrous Na_2SO_3 or 40 grams of $Na_2SO_3 \cdot 7\ H_2O$ in distilled water and dilute to 1 liter.

Test Specimen

The specimen shall consist of about 2 grams of a representative sample of air-dry disintegrated wood of known moisture content.

The samples of wood for analysis shall be prepared according to the procedures described in TAPPI Standard T 11 m.

Procedure

Weigh accurately approximately 2 grams of the prepared air-dry wood in a tared alundum crucible contained in a weighing bottle. Extract the crucible with contents for 6 hours, or overnight if more convenient, in a Soxhlet extractor with alcohol-benzene mixture. After evaporation of the solvent, wash the sawdust thoroughly with hot water, using a suction pump. Then transfer the moist material to a glass crucible with fritted glass bottom. The crucible is water jacketed and connected between the gas buret and the gas pipet, as shown in Fig. 1, by means of two rubber stoppers through which passes a capillary glass tubing. Apply suction, first at the bottom of the crucible until the excess moisture is removed, and then at the top. This removes the water from the fritted glass plate and evenly distributes the remaining moisture throughout the entire sample.

Pass a buret-full of Cl gas from the buret up through the material in the crucible and over into the gas pipet as fast as possible. The temperature of the

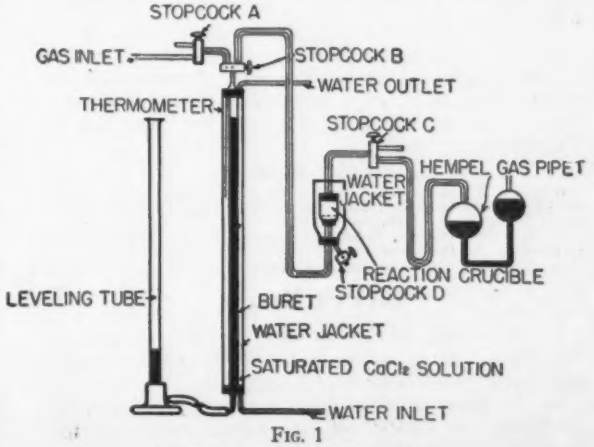

FIG. 1
Apparatus for Cellulose Determination

* This method has been approved as a tentative standard by the Chemical Methods Committee. Criticisms are earnestly requested and should be sent to R. G. Macdonald, Secretary, Technical Association of the Pulp and Paper Industry, 122 E. 42nd St., New York 17, N. Y. Reprints of this standard may be obtained from the Secretary at 25 cents each.

water in the water jacket should be between 23.5 and 32°C. (74 and 90°F.). During the first chlorination samples of wood absorb approximately 230 ml. of Cl gas at room temperature and atmospheric pressure. This necessitates refilling the buret, which may be done quickly as it is connected to a Cl tank with a three-way stopcock. The first chlorination treatment requires from 3 to 4 minutes, after which remove the crucible from the apparatus and wash the material by suction with approximately 50 ml. of distilled water, and successively with 50 ml. of approximately 3% SO_2 solution, 50 ml. of water, then 50 ml. of freshly prepared 2% Na_2SO_3 solution. Transfer the material to a 250-ml. Pyrex beaker, using a pointed glass rod, the last traces of material being removed from the crucible with 100 ml. of 2% Na_2SO_3 solution in the following manner:

Add approximately 15-ml. portions of the Na_2SO_3 solution to the crucible for each rinsing. When 60 ml. have been thus used, place 10-ml. portions of the remaining 40 ml. in a watch glass and by means of gentle suction applied to the top of the crucible, placed on the watch glass, remove all of the material from the fritted glass bottom of the crucible. A rubber policeman drawn gently over the bottom of the crucible assists in removing the last traces.

Cover the beaker containing the sample with a watch glass and place in a boiling water bath for 30 minutes. Again transfer the fibers to the glass crucible and wash with about 250 ml. of distilled water.

The above procedure is never sufficient to remove all the lignin, so that the treatment with Cl and subsequent washing with SO_2 solution, water, and Na_2SO_3 solution as outlined above must be repeated until the fibers show only a very faint tinge of pink upon addition of the Na_2SO_3 solution. The second and following treatments with Cl (after washing the specimen in the crucible with distilled water) should not require more than 2 or 3 minutes. Prolonged action of Cl gas, together with the HCl formed in the secondary reactions, hydrolyzes the cellulose, gives low yields, and causes varying amounts of alpha-cellulose.

After all the lignin has been removed, transfer the fibers to the alundum crucible and wash thoroughly by suction successively with 500 ml. of hot water, 50 ml. of 95% alcohol and finally with 50 ml. of ether. Then dry for 2½ hours at 100 to 105°C. in an oven.

Finally place the tared alundum crucible in the original stoppered weighing bottle, cool in a desiccator over conc. H_2SO_4 and weigh the residual cellulose.

Report

The weight of the residue shall be calculated, to one decimal place, as a percentage of the moisture-free weight of unextracted wood and reported as Cellulose.

References

Bray, M. W., and Andrews, T. M., "Factors Influencing the Properties of Wood Cellulose as Isolated by the Chlorination Method," *Paper Trade J.* 76, No. 8: 47 (Feb. 22, 1923).

U. S. Forest Products Laboratory, "Standard Testing Manual for Pulpwood, Pulp, Stuff, and Paper."

TAPPI Notes

C. H. Krebs has succeeded E. W. Kurtner as TAPPI official corporate representative of the Standard Cap & Seal Company, Chicago, Ill.

H. C. Merritt, chief engineer, has succeeded E. T. Street as TAPPI official representative of the Downingtown Mfg. Company.

John McMrystle, formerly of the Chicopee Mfg. Corporation, is now a consulting engineer at R. F. D. No. 1, Box 459, New Brunswick, N. J.

The TAPPI Delaware Valley Section will meet at the Engineers Club, Spruce Street, Philadelphia, Pa., on January 3, 1947, at 6:30 p.m. Robert S. Aries of the Polytechnic Institute of Brooklyn will talk on "Market Research as an Aid to Production Development."

The TAPPI Ohio Section will meet at the Hotel Manchester, Middletown, Ohio, on Saturday, January 11, 1947, at 6:30 p.m. There will be a round table discussion on "Running a Mill With Less Water." Frederic C. Clark, Consulting Engineer, New York, N. Y., and Arthur Thurn of the Champion Paper and Fibre Company will lead the discussion.

The Northern New York Group of the TAPPI Empire State Section will meet at 6 p.m., Thursday, January 9, 1947, at Pine Lodge, Black River, N. Y. E. C. Tucker of the Stebbins Engineering Company of Watertown, N. Y., will talk on "Corrosion Resistant Linings for Pulp Mills."

Western New York Group Hears Thomas on Lighting

The Western New York Group of the Empire State Section of TAPPI held its monthly meeting on Wednesday, December 11th, at the Prospect House, Niagara Falls, N. Y., under the chairmanship of Dr. A. Nadelman. B. A. Thomas, the speaker, was introduced by Mr. Rusch.

Mr. Thomas, who is divisional engineer of the Empire Lamp Division, General Electric Company, traced the development of incandescent lighting from the early days of the first Edison lamp, which produced 1.4 lumens per watt, up to present day mercury arc and fluorescent lamps, which produce 60 and 65 lumens per watt. He demonstrated many types of special lights. Among these were the germicidal lamp for destroying airborne bacteria and a lamp for producing "black light," under the rays of which fluorescent materials can be made to glow brilliantly.

In connection with matching of color shades, Mr. Thomas emphasized the need for adequate lighting. He stressed that, because of the variable human factor in this connection, every precaution should be taken to judge color under constant illumination. He considered two sources of illumination to be essential at 6500° Calven color temperature.

Mr. Thomas forecast further developments that will add to human comfort as the sun is brought more and more indoors.

Those attending the meeting were as follows: R. M. Drummond, J. R. Rawlings, Clinton O. Webber, A. L. Trumpler, Joseph F. Sheehy, E. Frederick Andrews, W. A. Stone, Vernon Woodside, B. A. Shomar, Navarre Foster, Charles L. Myers, Wm. Beck, Francis J. Wilcox, R. C. Quick, W. D. Stitt, E. G. Eschner, M.D., R. McCully, Caleb S. Taft, D. H. Gimber, Frederick P. Heil, Ralph Eiff, Paul T. Kuhnel, Otto Chicner, B. J. Staneslow, Gaylor M. Uptegraff, J. T. Jaeger, George E. Norton, Gordon K. Stone, A. H. Nadelman, W. M. Orchard, Robert D. Rusch, Robert G. Vaeth, Arthur C. Hayes, G. H. Rand, Jr., John Morrison, Salvatore M. Scaletta, Joseph P. Early, E. J. Johnstone, Roy J. Carley, F. R. Boyle, H. P. Bailey.

The Hot Alkaline Purification of Cellulose

II. Cooking of Pine Wood by the Sulphate Process in One and Two Stages, and Hot Alkaline Purification of Pine Sulphate Pulp

By Alexander Meller[1]

Abstract

Pine wood chips were pulped by the sulphate process in a single stage, applying relatively high alkali charges on the weight of wood and relatively low temperatures (pressures). The pulps obtained showed pentosan contents of 4.5 to 5.5%, alpha-cellulose contents of 91 to 92%, and solution viscosities in cuprammonium of 1 to 15 poises.

Pulps were also produced by a two-stage sulphate process, applying in the first cooking stage relatively high alkali charges at relatively low pressure. This first stage pulping was interrupted, the greater part of the black liquor drained off, replaced by white liquor and a second cooking performed. The resultant pulps contained 3 to 4% pentosans, 91 to 93% alpha-cellulose, and their solution viscosity in cuprammoniums was about 2 poises.

Finally, pine wood chips were pulped by the sulphate process as referred to above and, after removing the black liquor and washing the pulps free of alkali, they were subjected to a second sulphate cooking. The pulps obtained had 2 to 3% pentosans, 93 to 94% alpha-cellulose, and solution viscosities of about 1 poise.

It is concluded that by applying a two-stage sulphate process on pine wood, pulps of high purity can be produced with the use of the customary digesters for sulphate pulping.

It has been stated many times in the literature that wood pulps produced by alkaline pulping methods are not suitable materials for treatment by the so-called hot alkaline purification process *(1)*. This hot alkaline purification method consists essentially in treating wood pulps with relatively weak alkaline solutions at high temperatures. Sulphite wood pulps respond very well to this hot alkaline purification process; sulphite pulps purified in a chlorinated or semibleached form become relatively high in alpha-cellulose content and low in pentosan materials. The reason for the failure with alkaline processed pulp referred to above is not known exactly. The various views about it, and explanations advanced, have been reviewed and discussed extensively in a survey dealing with the purification of wood cellulose by hot alkali *(2)*.

The cold alkaline process seems to have found a wider application for the production of purified wood cellulose from sulphate and soda wood pulps. This process applies relatively strong alkaline liquors at low temperatures but requires special apparatus facilitating the intimate mixing of pulp and purifying liquor, the recovery of alkali, and the washing of the purified pulp free of alkali. The efficiency of all these operations materially influences the economy of the cold alkaline purification process *(3)*. In addition, the chemical and physical properties of cold-alkaline-refined sulphate pulps may be very different from those of the hot-alkaline-purified sulphite pulps *(4)*.

In view of the drawbacks mentioned above, it appears attractive to devise a method for producing, from sulphate pulps, products with high alpha-cellulose and low pentosan contents, accompanied by suitable physical characteristics, without the application of strong cold alkaline liquors, which requires a separate plant.

The present paper describes some experiments which were planned to achieve this aim.

The underlying idea in formulating the program of work may be characterised as follows: it is generally known that in pulping wood by the sulphate process, the rate of pulping decreases because of the consumption of alkali. Some other factors may also contribute to the slowing down of the rate of pulping. One of them is regarded as the decrease in diffusion of alkali into the interior of the fibers, presumably because of an uptake of alkali by the organic materials dispersed in the black liquor. Thus it can be anticipated that, by interrupting the pulping and replacing the black liquor by fresh white liquor, the rate of removal of the constituents of wood can be increased. In other words, the pulping of wood by the sulphate process in two stages, and under controlled conditions as regards alkali charge, pressure, and period of pulping, may remove more of the undesired constituents of the wood, and yield pulps of greater purity.

A multistage alkaline pulping process for hardwoods was suggested by Kienitz *(5)*. In accordance with the counter current principle, the wood chips are digested in a battery of digesters. The freshly charged chips are first treated with black liquor of the lowest alkali content and precooked chips are then digested with progressively stronger liquors, and ultimately with fresh white liquor. Overbeck devised *(6)* a two-stage kraft process in which the chips are first digested with black liquor originating from the second cooking stage and then cooked with fresh white liquor. The pulps produced by this process are described as having relatively high alpha-cellulose content; but, in order to achieve a greater purity, a further purification by cold strong alkali is recommended.

Brauns and Grimes *(7)*, in studying the actual chemical reactions taking place during the alkaline cooking of wood, obtained pulps in a relatively low yield by a two-stage alkaline cooking process. According to these workers, this low yield may be the result of the use of fresh cooking liquor in the second stage, and of the low concentration of dispersed reaction products which would buffer the alkali solution.

The underlying idea of a program of work was characterised, in broad lines above. Based on this, the objectives can be set out in detail as follows:

1. Cooking of pine wood chips by the sulphate process in a single stage, applying relatively low pres-

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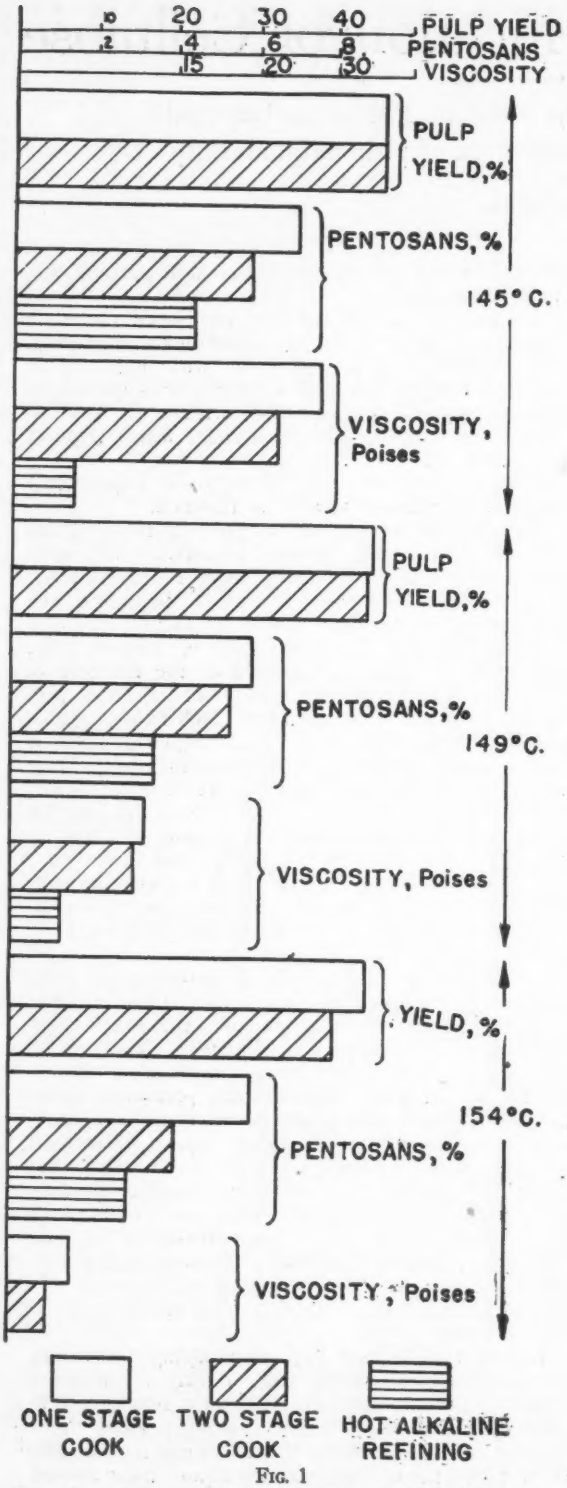

FIG. 1

Comparison of One- and Two-Stage Cooking, and Hot Alkaline Refining (Using 40% NaOH in First Stage)

sure and high alkali charges. (Referred to later as "single-stage cooking.")

2. Cooking of pine wood chips by the sulphate process in a single (first) stage, as under (1). After draining off the greater part of the black liquor and replacing it by white liquor, the pulp obtained after the first cooking stage is subjected to a second sulphate cooking procedure. (Referred to later as "two-stage cooking.")

3. Cooking of pine wood chips by the sulphate process as under (1), washing the pulps obtained free of alkali, and subjecting them to a second sulphate digestion. (Referred to later as "hot alkaline purification.")

4. Estimation of pulp yield, and extent of pentosan removal in the single- and two-stage cookings.

5. Determination of chemical characteristics of the pulps produced by the single-stage, two-stage, and hot alkaline purification processes.

Experimental

Materials Used.

The wood used in the investigation was 12 to 15 year old *Pinus radiata* (also called *Pinus insignis*, or Monterey pine) ex Creswick, Victoria, Australia. The wood chips were carefully handsorted and screened over a 0.75-inch wire. The average size of the chips after this sorting can be taken as 5/8 to 3/4 inch long, 3/4 to 1 inch wide, and 1/8 inch thick.

The white liquor used was of commercial grade with a constant sulphidity of 22%, (TAPPI).

Apparatus

The experiments were performed in stainless steel digesters of cylinderical form, and of 205 ml. capacity. They were heated in a thermostatically controlled oil bath, being adjusted by means of springs to a horizintal shaft in the oil bath. This shaft with the autoclaves was driven by a motor, providing in this way rotation of them, and at the same time a moving of the oil in the bath, thus eliminating local overheating.

Procedure

Cooking in One and Two Stages. In the single stage cooking experiments, the digesters with the charges were heated up from room temperature to the reaction temperature in the oil bath over a period of 2 hours. At the expiration of the predetermined cooking period, the digesters were quenched with cold water, the pulp separated from the black liquor, washed, lapped, and dried. A sample of black liquor was also put aside for analysis.

In performing the cooking in two stages, the heating up of the reaction mixture in the first stage was done in the same way as in the single stage experiments. At the end of the first cooking stage, the greater part of the liquor was drained off from the digesters, and the digested chips (pulp) were not removed from them. The volume of the black liquor drained off was measured, and its alkali content determined. After introducing the appropriate volume of white liquor, the digesters were immersed in the oil bath, heated up beforehand to the reaction temperature. At the end of the second cooking stage, the procedure involving quenching of the digesters, separating the pulp, etc., was accomplished in the same way as described above.

Hot Alkaline Purification. In these experiments the pulps were produced by cooking the chips as in the the first sulphate stage and washing them free of alkali. The pulps were then mixed with an appropriate volume of white liquor, replaced in the digesters, and immersed in the oil bath which had been heated up beforehand to the required reaction temperature. All the cooking experiments were carried out without relief. At the end of the purification period, the procedure was as described above.

Conditions of Cooking and Purification

In the single stage cooking experiments, as well as in the first stage of the two stage cooking experiments the moisture-free wood-liquor ratio was 1:33. The caustic soda percentage applied refers to total alkali, expressed as NaOH on moisture-free weight of wood charged. Cooking temperature (pressure) and period of cooking were varied as described in the relevant tables below.

In the second cooking stage the pulp stock concentration and percentage of alkali were constant all through the experiments: 5.5% as NaOH-solution at 12.5% stock concentration (moisture-free), corresponding to 44% NaOH on the moisture-free weight of pulp ex first stage. The volume of black liquor drained off at the end of the first stage was kept approximately constant. The temperature in the second stage was always the same as that in the first stage; the period of cooking in the second stage was varied. The details of the experimental conditions can be seen in the relevant tables below.

Analytical Methods and Interpretation of Results

The following determinations were made:

1. Yield of pulp after the single (first) stage cooking, based on the weight of wood. No screening of the pulps was necessary because no appreciable quantities of shives appeared to be present in them.
2. Yield of pulp after the second cooking stage, based on the weight of wood, and on the weight of pulp ex first cooking stage.
3. Pentosan content of wood and of pulps, according to the method and interpretation of Kröber-Tollens *(8)*.
4. Alpha-cellulose content, employing ground pulp obtained by grinding pulp sheets in a Wiley mill, and using the following technique: 1 gram of pulp treated with 25 ml. of 17.5% sodium hydroxide solution at 20°C. for 45 minutes; liquor separated by filtering the pulp residue on a sintered glass crucible. This residue was washed with 50 ml. of 8% sodium hydroxide solution, followed by washing with water, dilute acetic acid and water, and was finally dried to a constant weight at 105°C.*
5. Permanganate number, according to the TAPPI standards, but applying 25°C. instead of 20°C.
6. Solution viscosity in cuprammonium solution containing 11.0 gram copper (Cu) and 205 gram ammonia (NH_3) per liter solution, and measuring the falling time of metal balls in a 2% pulp dispersion.
7. Residual alkali of the black liquor, according to the TAPPI Standards.

The yield figures quoted, and all the figres which were calculated on the basis of pulp yield are only approximations, since an accurate determination of the pulp yield could not be made. Knowing the quantity of pulps produced, the pentosan content of the wood used and of the pulps, the extent of the pentosan removal was calculated, and the relevant values listed in the tables below.

From the alkalinity of the black liquor, the caustic soda consumption during cooking was approximated. In a separate column in the tables, the concentration of the black liquor, expressed as aqueous sodium hydroxide solution is also tabulated.

The experiments described below were performed by Mr. J. G. Taylor**

Results

These are listed below in the Tables I to V, and are shown by the histograms in Figs. 1 and 2.

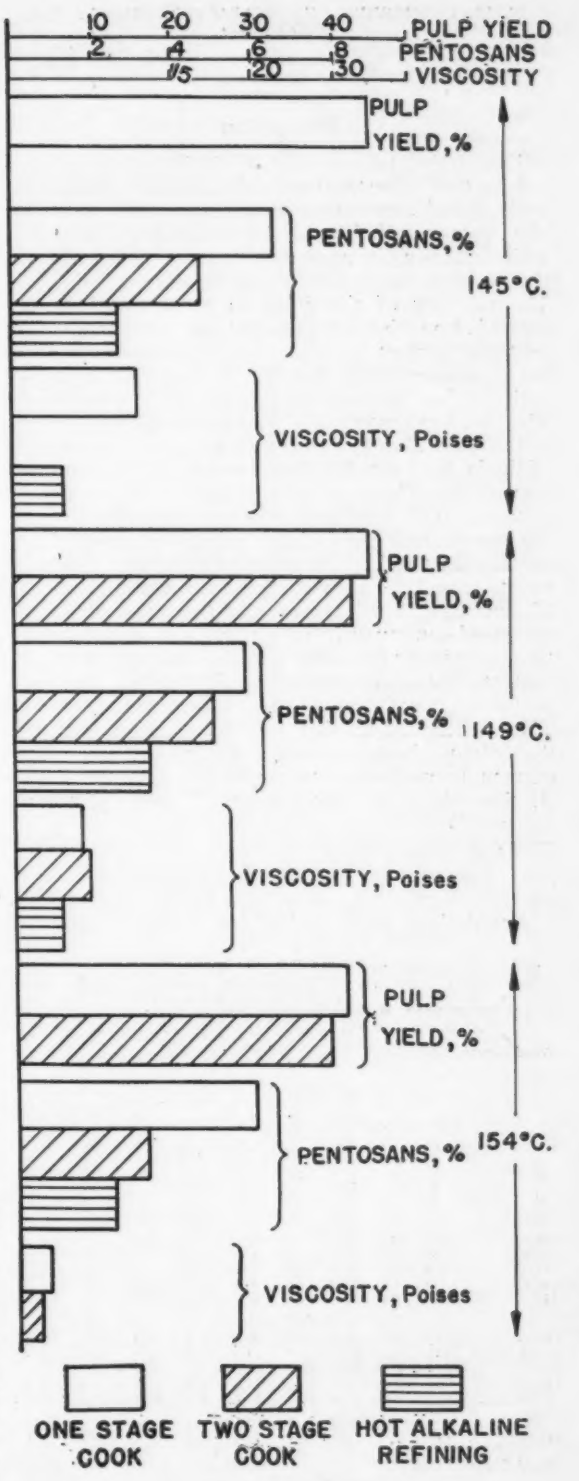

Fig. 2
Comparison of One- and Two-Stage Cooking, and Hot Alkaline Refining (Using 50% NaOH in First Stage)

* Experience gained revealed that by applying disintegrated pulp, instead of ground pulp, for instance by using a hammer mill, the same technique in determination gives 2 to 3 units higher alpha-cellulose values. Thus the alpha-cellulose values reported in the tables may be too low.

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TABLE I.—SHOWING THE CHARACTERISTICS OF THE WOOD USED

Pentosans, %	Lignin, %	Solubility in Organic Solvents, %
15.8	20.9	2.6

Discussion

Single-Stage Cooking Experiments

Effect of Temperature. At constant period of cooking and constant percentage of caustic soda applied to the wood charged, the yield of pulp decreased with increasing temperature (pressure) applied in the cooking, as shown by the figures in Table II. The viscosity of the pulps in cuprammonium decreased also with raising the cooking temperature. The pentosan content of the pulps decreased similarly, but it seems unlikely that this decrease will continue with further increase in the cooking temperature. The pentosan content of a pulp produced is the result of the removal of pentosan materials, of cellulose and of lignin from wood (apart from minor constituents in wood). The rate of removal of non-pentosan materials (cellulose) seems to increase with increasing temperature more than the rate of removal of pentosan materials. The result of these two opposing effects may be a pulp of greater pentosan content. The pulp yield and viscosity of the pulps produced decreased continuously with rising cooking temperature, supporting the contention that the final pentosan content depends essentially on the relative rates of pentosan removal and of nonpentosan removal. There are indications that with increasing temperature the cellulose becomes more degraded and goes into solution in preference to pentosan. (See in Table II, the values for "total removal" and "pentosan removal.")

Effect of Alkali Charge on Wood. The influence of percentage alkali applied on the weight of wood has not been investigated extensively; 40 and 50% sodium hydroxide have been used at five different temperatures (pressures), and at two different cooking periods, while 60% caustic soda was applied at one temperature only.

TABLE II.—SHOWING THE INFLUENCE OF TEMPERATURE (PRESSURE) AND OF PERCENTAGE CAUSTIC SODA ON WOOD IN THE SINGLE-STAGE COOKING ON YIELD OF PULP, PENTOSAN REMOVAL, CHARACTERISTICS OF PULPS AND ON CONSUMPTION OF CAUSTIC SODA

Wood-Liquor Ratio 1:3.3 — Period of Cooking, 2 + 2.5 hours

Cook No.	Temperature, °C.	Pressure, p.s.i.	NaOH Consumed, % on wood	% NaOH Solution at the End	Pulp Yield, % on wood	Pentosans, % in pulp	Total Removal, %	Pentosan Removal, %	Viscosity, poises
40% NaOH on Wood									
44C65.....	145	46	16.9	5.4	51.3	7.4	48.7	12.0	42.2
44C48.....	149	53	17.5	5.2	49.1	6.9	50.9	12.4	26.0
44C23.....	154	62	18.9	4.9	44.7	5.6	55.3	13.3	14.1
44C83.....	158	71	19.3	4.8	42.3	5.5	57.7	13.5	4.2
44C80.....	162	80	19.9	4.7	40.0	5.4	60.0	13.6	2.2
50% NaOH on Wood									
44C69.....	145	46	16.9	7.7	49.6	6.5	50.4	12.6	19.4
44C60.....	149	53	19.1	7.2	46.8	6.2	53.2	12.9	11.9
44C26.....	154	62	20.7	6.8	44.0	5.5	56.0	13.4	4.0
44C84.....	158	71	21.4	6.6	38.9	4.8	61.1	13.9	1.2
44C81.....	162	80	21.2	6.6	37.6	4.3	62.4	14.2	0.9
60% NaOH on Wood									
44C71.....	145	46	21.5	8.9	44.7	5.3	55.3	13.4	7.0
Wood Liquor Ratio 1:3.3 — Period of Cooking 2 + 4.5 hours									
40% NaOH on Wood									
44C66.....	145	46	18.4	5.0	46.2	7.0	53.8	12.6	28.6
44C52.....	149	53	18.5	5.0	45.4	5.7	54.6	13.2	11.9
44C24.....	154	62	20.3	4.6	43.7	5.9	56.3	13.2	5.3
44C87.....	158	71	20.0	4.6	39.3	5.5	60.7	13.6	1.5
50% NaOH on Wood									
44C70.....	145	46	20.8	6.8	45.2	6.5	54.8	12.9	11.4
44C54.....	149	53	21.9	6.5	43.5	5.7	56.5	13.3	5.8
44C29.....	154	62	22.8	6.3	41.4	5.8	58.6	13.4	1.6
44C88.....	158	71	22.5	6.4	36.1	4.8	63.9	14.1	0.5
60% NaOH on Wood									
44C72.....	145	46	25.1	8.1	43.7	4.7	56.3	13.8	1.4

TABLE III.—SHOWING THE INFLUENCE OF TEMPERATURE AND PERCENTAGE CAUSTIC SODA ON WOOD IN THE FIRST STAGE, AND THE EFFECT OF TEMPERATURE AND OF COOKING PERIOD AT CONSTANT PERCENTAGE CAUSTIC SODA SOLUTION IN THE SECOND STAGE ON YIELD OF PULP, PENTOSAN REMOVAL, CHARACTERISTICS OF PULPS, AND ON CONSUMPTION OF CAUSTIC SODA

First Stage: Wood-Liquor Ratio 1:3.3, Period of Cooking 2 + 2.5 hours						Second Stage: Pulp Stock Concentration 12.5% moisture-free, Period of Cooking 2 hours, Temperature as in the First Stage						
Temperature, °C.	% NaOH Sol. at End	Pulp Yield, % on wood	Pentosans, % in pulp I	Pentosan Removal, %	Viscosity, poises	Serial No.	Pulp Yield, % on wood	Pulp Yield, % on pulp I	Pentosans, % in pulp II	Pentosan Removal, % on wood	Pentosan Removal, % on pulp I	Viscosity, poises
40% NaOH on Wood						**5.5% NaOH Solution**						
145	5.4	51.3	7.4	12.0	42.2	44B35	45.6	88.8	5.8	13.4	2.6	24.6
149	5.2	49.1	6.9	12.4	26.0	44B27	44.6	90.3	5.3	13.4	2.1	11.0
154	4.9	44.7	5.6	13.3	14.1	44B39	40.0	89.5	3.9	14.2	2.1	2.9
50% NaOH on Wood						**5.5% NaOH Solution**						
149	7.2	46.8	6.2	12.9	11.9	44B14	42.1	90.3	4.8	13.8	1.9	6.6
154	6.8	44.0	5.5	13.4	4.0	44B40	39.1	88.8	3.1	14.6	2.7	1.1

First Stage: Wood-Liquor Ratio 1:3.3, Period of Cooking 2 + 2.5 hours						Second Stage: Pulp Stock Concentration 12.5% moisture-free, Period of Cooking 4 hours, Temperature as in the First Stage						
40% NaOH on Wood						**5.5% NaOH Solution**						
149	5.2	49.1	6.9	12.4	26.0	44B28	39.3	80.1	4.4	14.1	3.4	5.7
50% NaOH on Wood						**5.5% NaOH Solution**						
149	7.2	46.8	6.2	12.9	11.9	44B16	36.8	78.9	3.4	14.5	3.5	1.8

At constant period of cooking, and constant temperature, the pulp yield decreased with increasing percentage alkali applied. Similarly, with increasing alkali on the wood in the cooking, the pentosan content and viscosity in cuprammonium of the pulps produced decreased. These results can be seen in Table II. The percentage pentosan removal increased as well, but it is questionable whether, with a further increase of the alkali percentage on the weight of wood, the same relationship would hold, particularly at higher pressures.

Effect of Cooking Period. The influence of the period of cooking has been investigated to a very limited extent, only two different cooking periods being applied.

Longer cooking brought about a relatively small decrease in pulp yield, negligibly small increase in pentosan removal, but a considerable degradation of the fibers, as measured by the viscosity in cuprammonium of the pulps produced. (See Table II.) This indicates that a further prolongation of the pulping would cause a degradation of the fibers, accompanied by a decreased pulp yield, probably without further purification effect.

Summarizing the results of experiments on the cooking of pine wood chips by the kraft process in a single stage, it appears that, by applying relatively low temperatures (pressures) and high alkali charges, pulps were obtained of relatively low bleachability and relatively low viscosity in cuprammonium, considering their degree of purity.

Two-Stage Cooking Experiments

As mentioned in the experimental part, the conditions of cooking in the second stage were constant as regards percentage caustic soda applied on the weight of pulp, and pulp stock concentration. Variables were the temperature, and in a few cases, the period of cooking; the temperature applied in the

second stage was always the same as in the first stage of cooking.

It has to be mentioned that results of some preliminary experiments (not reported here) revealed that the efficiency of the second cooking stage is largely influenced by the volume and strength of the black liquor remaining in the pulp after draining off the bulk at the end of the first cooking stage. The black liquor was, in all cases, drained off as far as possible without removing pulp from the digesters. Since the alkalinity of the black liquor formed in the first cooking stage varies with the cooking conditions applied, the volume of white liquor introduced for performing the second cooking varies also. Apart from this, both the organic materials dispersed in the black liquor and those retained by the pulp, due to their nature and quantity, may considerably influence the rate of reactions in the second cooking stage. For this reason the results of the two stage cooking experiments should firstly be compared with the relevant single stage experiments, in which the black liquor is formed, and remains literally through the entire cooking period in contact with the pulp. Secondly, comparison may be made between the two stage cooking experiments and relevant hot alkaline purification experiments. In the latter, pulps from the first stage, washed free of black liquor, were used. (See Table V, and Figs. 1 and 2.) The effect of black liquor remaining at the end of the first stage, on the removal of constituents in the second stage has not been investigated; the significance of the volume of black liquor rmaining in the pulp, and of its nature, was realised in the course of some preliminary experiments.

In the experiments when 50% sodium hydroxide on the weight of wood was applied, the strength of the black liquor at the end of the first stage, expressed as its caustic soda content, was greater than that of the pulp-liquor mixture at the beginning of the second cooking stage.

TABLE IV.—SHOWING THE INFLUENCE OF TEMPERATURE AND OF PERCENTAGE CAUSTIC SODA ON WOOD IN THE FIRST STAGE AND THE EFFECT OF TEMPERATURE AND OF REFINING PERIOD AT CONSTANT PERCENTAGE CAUSTIC SODA SOLUTION IN THE HOT ALKALINE REFINING STAGE ON CHARACTERISTICS OF PULPS

Cooking Stage: Wood-Liquor Ratio 1:3.3, Period of Cooking 2 + 2.5 hours					Hot Alkaline Refining Stage: Pulp Stock Concentration 12.5% moisture-free, Period of Refining 2 hours, Temperature as in the Cooking Stage		
40% NaOH on Wood					5.5% NaOH Solution		
Temperature, °C.	% NaOH Solution at the End	Pulp Yield, % on wood	Pentosans, % in pulp	Viscosity, poises	Serial No.	Pentosans, % in pulp	Viscosity, poises
145	5.4	51.3	7.4	12.0	44B33	4.2	5.0
149	5.2	49.1	6.9	12.4	44B9	3.3	4.0
154	4.9	44.3	5.6	13.3	44B1	2.8	...
158	4.8	42.3	5.5	13.5	44B51	2.5	1.0
162	4.7	40.0	5.4	13.6	44B54	2.0	0.8
50% NaOH on Wood					5.5% NaOH Solution		
145	7.7	49.6	6.5	19.4	44B34	2.6	4.8
149	7.2	46.8	6.2	11.9	44B10	3.2	3.5
154	6.8	44.0	5.5	4.0	44B3	2.3	1.0
158	6.6	38.9	4.8	1.2	44B52	1.8	0.6
162	6.6	37.6	4.3	0.9	44B55	1.7	0.4
Wood-Liquor Ratio 1:3.3, Period of Cooking 2 + 2.5 hours					Pulp Stock Concentration 12.5% moisture-free, Period of Refining 4 hours, Temperature as in the Cooking Stage		
40% NaOH on Wood					5.5% NaOH Solution		
149	5.2	49.1	6.9	12.4	44B11	3.5	3.1
50% NaOH on Wood					5.5% NaOH Solution		
149	7.2	46.8	6.2	12.9	44B12	2.2	1.8

The results of these experiments show the particular benefit of the two stage cooking, i.e., yielding pulps of very low pentosan content. (See experiments 44B36, 14, 40, and 16 in Tables III and V.)

It should furthermore be noted that, at the end of the first-stage cooking, the pulp-liquor ratio was not the same as at the beginning of the second cooking

TABLE V.—COMPARISON OF ONE AND TWO STAGE COOKING AND HOT ALKALINE REFINING

Conditions for Preparing Pulp			Characteristics of Pulp				
First Stage	Second Stage	Refining Stage 145° C.	Serial No.	Pentosans, %	Permanganate No.	Alpha-Cellulose, %	Viscosity, poises
40% NaOH 2 + 4.5 hr.							
40% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C66	7.0	...	...	28.6
			44B35	5.8	...	...	24.6
40% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr.	44B33	4.2	...	...	5.0
50% NaOH 2 + 4.5 hr.							
50% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C70	6.5	...	...	11.4
			44B36	4.6	...	...	...
50% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr. 149° C.	44B34	2.6	...	...	5.0
40% NaOH 2 + 4.5 hr.							
40% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C52	5.7	19.5	91.8	11.9
			44B27	5.3	17.3	90.7	11.0
40% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr.	44B9	3.3	13.9	93.5	4.0
50% NaOH 2 + 4.5 hr.							
50% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C54	5.7	17.1	93.0	5.8
			44B14	4.8	...	93.0	6.6
50% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr. 154° C.	44B10	3.2	14.5	94.0	3.5
40% NaOH 2 + 4.5 hr.							
40% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C24	5.9	12.8	...	5.3
			44B39	3.9	10.8	...	2.9
40% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr.	44B1	2.8	...	...	...
50% NaOH 2 + 4.5 hr.							
50% NaOH 2 + 2.5 hr.	5.5% NaOH-sol. 12.5% stock conc. 2 hr.		44C29	5.8	11.5	...	1.6
			44B40	3.1	10.0	...	1.1
50% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr. 158° C.	44B3	2.3	...	...	1.0
40% NaOH 2 + 4.5 hr.							
40% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr.	44C87	5.5	...	...	1.5
			44B51	2.5	...	...	1.0
50% NaOH 2 + 4.5 hr.							
50% NaOH 2 + 2.5 hr.		5.5% NaOH-sol. 12.5% stock conc. 2 hr.	44C88	4.8	...	...	0.5
			44B52	1.8	...	...	0.6

stage. All the second-stage cooking experiments were performed at 12.5% pulp stock concentration. The pulp stock concentration in the second stage was higher than in the corresponding single stage cooking experiments during the 2.5 to 4.5 hour period. This higher pulp stock concentration may have contributed also to the favorable results of the two stage cooking experiments under the conditions chosen. It appears that the rate of removal of non-pentosan materials was lower at the higher pulp stock concentration, and that the assumed retardation was counteracted by introducing fresh white liquor for the second cooking stage.

In summary, it can be said that, by the two stage sulphate cooking process, pulps of great purity, relatively low solution viscosity in cuprammonium, and low bleachability have been produced. Some bleaching experiments (to be described in a further communication) resulted in pulps of a high degree of whiteness, alpha-cellulose content of 91 to 93% and pentosan content of 3 to 3.5%.

It appears that the two-stage sulphate cooking may be accomplished in the ordinary digesters used for sulphate pulping. The effluent liquors can be recovered in the customary manner, and the pulps, when bleached, may result in products comparable with cold alkaline refined kraft pulps as regards purity. It is anticipated that the physical properties (surface properties, morphology and reactivity) of the two-stage kraft cooked pulps will be different from those obtained by the cold alkaline purification of kraft pulps. The study of the physical properties of both types of kraft pulp forms the subject of a subsequent investigation.

Hot Alkaline Purification

Before going into a discussion of the observations made in connection with these experiments, it should be recalled that the term hot alkaline purification of wood pulps generally implies the application of hot weak alkaline solutions, and while successfully used for purifying sulphite pulps, the purification effect of such solutions, when applied to sulphate pulps, is very limited.

On applying relatively strong sulphate liquors at high temperatures to sulphate pulps, which were produced under controlled conditions, an extensive purification was noticeable, accompanied, however, by a very considerable degradation of the fibers as measured by the viscosity of the resultant pulps in cuprammonium. Under comparable conditions the pentosan content of the hot alkaline refined pulps was lower than that of the corresponding pulps obtained by the two-stage process. (See Table V.) The hot alkaline refining experiments resulted in some cases in pulps with pentosan contents lower than 2%, approximating the pentosan content of high quality purified sulphite pulps, but of lower viscosity in cuprammonium.

In summary, it appears that the hot alkaline purification experiments performed on sulphate pulps, applying strong sulphate liquors at high temperatures, resulted in products of high purity and low solution viscosity in cuprammonium.

Conclusions

Applying relatively low temperatures (pressures) and high percentage of alkali to pine wood, pulps have been produced of moderate purity.

By a two-stage sulphate cooking process, employing low temperatures and high alkali charges on the wood in the first stage, and relatively strong sulphate liquor in the second stage, pulps have been produced of high purity and low bleachability. The viscosity in cuprammonium of these pulps is relatively low. The second sulphate digestion was performed after draining off the greater part of the black liquor formed in the first stage, and replacing this by kraft white liquor. Such two-stage sulphate cookings may be accomplished in the ordinary digesters used in sulphate mills, and by doing so the extra cost involved in the process for producing purified sulphate pulps by the cold alkaline refining process could be eliminated.

Sulphate digestion on sulphate pulps, produced under controlled conditions, resulted in pulps of very high purity, accompanied by a material degradation of the fibers.

It is proposed to bleach the pulps produced by the two-stage sulphate process, and to investigate their physical properties, involving their reactivity in heterogeneous reactions, surface properties, chain length distribution, etc., and their suitability for making cellulose derivatives. It is also proposed to compare the quality of these pulps with that of high grade purified sulphite and sulphate pulps obtained by the cold alkaline purification process.

Patent specifications have been made covering the main principles of the process described in this paper.

Acknowledgment

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Literature Cited

1. Richter, G. A., *Ind. Eng. Chem.* 33: 1518-1528 (1941).
   Rosenberg, N. A., *Zellstoff u. Papier* 21: 184-188, 210-214 (1941).
2. Meller, A., *Paper Trade J.* 121, No. 13: 133-145 (1945).
3. Jayme, G., *Paper-Maker* 44: 184-192 (1937).
4. Investigation in progress.
5. Kienitz, G. A., *Holz Roh u. Werkstoff* 1: 30-50 (1937).
6. Overbeck, W., German pat. 731,181 (Feb. 3, 1943).
7. Brauns, F. E., and Grimes, W. S., *Paper Trade J.* 108, No. 11: 40-43 (1939).
8. Dorée, Ch., "The Methods of Cellulose Chemistry," 1st ed., page 362, London, Chapman & Hall, Ltd., 1933.

New Riches from the Soil

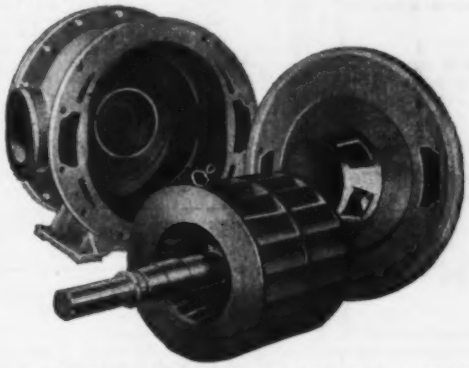
D. Van Nostrand Company has just issued "New Riches from the Soil," by Wheeler McMillen, president of the Farm Chemurgic Council and editor of the Farm Journal (395 pp. 6 x 8½). This is a popular style book dealing with the development of farm chemurgy and some accomplishments in this field.

Among the interesting stories told are the following: The cigaret paper story; Corn, a crop with new ideas; Corncobs and oat hulls; Soybeans, a new crop that has arrived; New crops for wheat and cotton lands; The empire of fibers; Wealth from the woods; Animal chemurgy; Alcohol, and American Farm Rubber.

Mr. McMillen is probably one of the best informed individuals in the field of farm chemurgy and has used his excellent editorial background to popularize this subject. The progress of chemurgy may well serve as a basis for a new economic and industrial security throughout the world. This first real book on the subject of farm waste utilization is welcome.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $3 per copy.

SIMPLICITY



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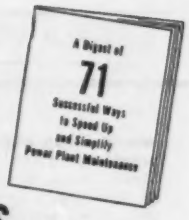

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MATERIALS · METHODS · SERVICE · FOR EVERY CLEANING REQUIREMENT

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For the Paper Manufacturer
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will cut from four to five tons of rags an hour. One of several types to meet all needs of coarse and fine paper making.

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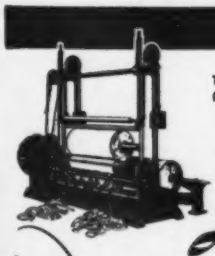

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***The* SMITH & WINCHESTER *Mfg.* Co.**
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HELP WANTED

HELP WANTED

CHIEF ENGINEER

We desire to employ a chief engineer experienced in construction and in power plant operation, to be in complete charge of such work at our mill at Stroudsburg, Pennsylvania. This mill comprises one machine of approximately 80 tons daily capacity, producing folding grades. Our power plant consists of boiler capacity of 80,000 pounds per hour and a Westinghouse turbine of 1,000 K.W.

This position offers exceptionally fine future opportunities to any one willing to join us in a very aggressive rehabilitation program. A participating bonus will be paid to the successful applicant.

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Operator and engineer expert in manufacturing sulphate and soda pulp; splendid salary.
Chemists and chemical engineers $3,500-10,000 year.
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Plant engineers, master mechanics, designers and draftsmen.
Machine tenders and back tenders.

We invite correspondence (Strictly Confidential) with paper and pulp mill executives seeking new positions and with employers seeking new personnel. D-26

"POWER ENGINEER"

Excellent opportunity and permanent position for competent Power Engineer for Paper Mill in middle west. This is an unusual opportunity for advancement and to work directly with the President.

Address Box 46-902 care Paper Trade Journal. J-9

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Must have a technical knowledge and experience in paper and machinery and be able to design, make drawings, layouts and supervise machine construction and assembly. Work will include plant engineering in paper converting organization involving printing and embossing on paper. Excellent opportunity for self-expression with nationally known organization. Send detailed reply including experience, references and photograph.

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$2,500-$25,000. This thoroughly organized confidential service of 37 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

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For Technical Department of mill doing high grade clay coating on boxboard. Three years' paper mill experience required. Middlewest location. Box 46-890 c/o Paper Trade Journal. J-2

WANTED—TOUR FOREMAN

IMMEDIATE OPENING FOR A TOUR FOREMAN WORKING ROTATING SHIFTS.
ONE M. F. PICKUP AND ONE YANKEE PICKUP FOURDRINIER TISSUE MACHINES ARE OPERATING AT PRESENT. A THIRD HIGH SPEED TISSUE MACHINE WILL BE IN OPERATION IN LATE 1947.
WE PREFER A MAN 30-40 YEARS OF AGE WITH SOME TECHNICAL BACKGROUND. EXPERIENCE ON HIGH SPEED TISSUE MACHINES MAKING BOTH FLAT AND CREPED PAPERS DESIRABLE.
SEND COMPLETE RESUME GIVING EDUCATION AND EXPERIENCE TO
PERNSTROM PAPER MILLS, INC.
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We desire a man thoroughly experienced in making asphalt coated and laminated papers. College education desirable but not essential. Write Box 46-860 Paper Trade Journal, giving complete information on experience, age, education and references. D-26

WANTED—Tour Boss experienced in Folding Grades. Excellent opportunity for right man. Write giving complete details. Address Box 46-863 care Paper Trade Journal. J-2

WANTED—Experienced Board Machine Tenders in the tropics. Wages $400.00 per month, transportation expenses paid from U. S. Write Box 46-883 care Paper Trade Journal. D-26

WANTED — Working Master Mechanic for Board Mill located in Pennsylvania. Write giving complete details as to qualifications as well as salary expected and when available. Address Box 46-862 care Paper Trade Journal. J-2

EXPERIENCED MASTER MECHANIC for board mill in Northern New Jersey. An excellent opportunity for a permanent position at a good salary. State age, experience, etc. Address Box 46-853 care Paper Trade Journal. TF

EXPERIENCED ENGINEER with a practical knowledge of General Engineering, preferably with training and experience in cost estimating, design and construction of paper mills and power plants. State qualifications fully and give details, experience, age, desired salary and availability. Address Box 46-854 care Paper Trade Journal. J-2

FIRST CLASS MACHINE TENDER for Yankee Pick-up machine. Steady employment, 48 hour week. Base rate, $1.41½. Write direct to Superintendent, The Fox Paper Company, Lockland, 15, Ohio. D-26

MECHANICAL ENGINEER—Permanent position. To have charge of engineering and supervise maintenance and repair work with the assistance of our master mechanic. Mill in Middle West. Give complete experience and salary desired. Address Box 46-894 care Paper Trade Journal. J-9

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EXPERIENCED CARTON SALESMAN for Philadelphia territory, selling exclusively our diversified line of cartons and specialties to large consumers and jobbers. Liberal commission arrangement and advance drawing account. Empire Box Corporation, Garfield, New Jersey. M-20

ENGINEER—Exceptional opportunity for man experienced maintaining high speed lightweight paper-making machines. Assume full responsibility engineering department of eastern mill. Address Box 46-897 care Paper Trade Journal. D-26

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PRACTICAL COLOR DEMONSTRATOR
Laboratory and Mill

Former assistant superintendent with complete knowledge of all stock and full experience Paper Mill operation. Available at once.

Address Box 46-898 care Paper Trade Journal. J-16

Superintendent with years of sucessful management of large mills behind me. I am anxious to get back into the harness of running a two or three machine mill.

25 years experience in all grades of Tissues—Facial Tissues and Cellulose Wadding. Fine references from past employers. Salary is not important.

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Executive engineer 26 years managing mills. Designing and re-building plant and equipment for increased production with lower costs.

If your plant is not getting the production, commensurate with the ability of your machines to produce I can be of great value to you.

Available immediately for any location. Experience covers all grades of tissues, facial tissues and cellulose wadding—cylinder and fourdrinier machines.

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EUROPEAN PAPER EXPERT—20 years experience, M. Sc. diploma Prague, seeks connection with paper mill. Efficient administrator to rebuild and maintain plant. Now working as Chief Engineer in India. Address Box 46-794 care Paper Trade Journal. D-26

SUPERINTENDENT: Desires position with small concern interested in improving quality, increasing production, lower operating cost. Salary no object. Age 39 years. Excellent reference. Address Box 46-846 care Paper Trade Journal. D-26

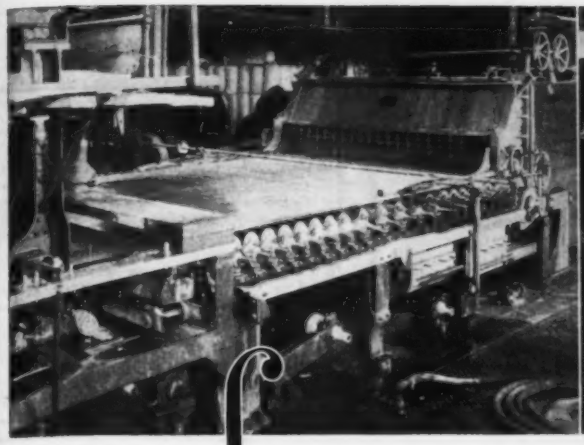
PLANT MANAGER—thorough experience in converting paper and boards; wants change to position offering better opportunity. Excellent production and labor relations background. Address Box 46-694 care Paper Trade Journal. D-26

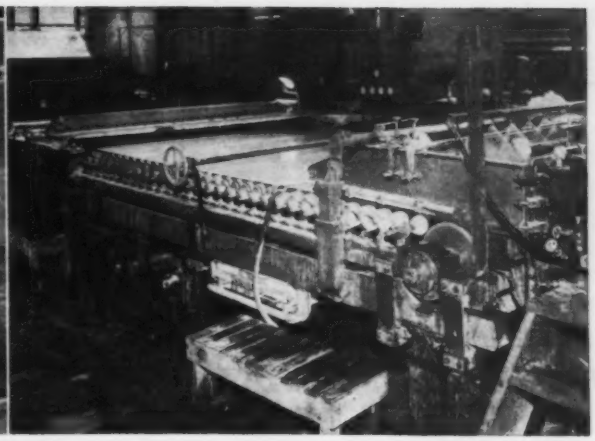
COATED PAPER COLOR CHEMIST—Open for position. Years of experience in fancy coated papers. No difficult in handling help. Address Box 46-887 care Paper Trade Journal. J-2

SUPER-CALENDER FINISHER—Thoroughly experienced in complete supervision. Unique knowledge in engineering in this field, calender rolls, adjustments, improvements. Good technical knowledge in finish analysis. Familiar with costing and other converting equipment. Address Box 46-886 care Paper Trade Journal. J-2

SUPERINTENDENT—Practical Paper Maker on cylinder machines. Wide experience making board for Pure Food Containers, Folding Boxboard, Test Liner and Wall Board. Can produce quantity with quality. Address Box 46-892, care Paper Trade Journal. J-9

POSITION WANTED as Superintendent or assistant. Would consider position as night supt. or Tour Boss with a future, or on west coast and south. Twenty-five years experience in making all grades of folding board, test liner and roofing felts. Address Box 46-901 care Paper Trade Journal. J-2





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It is a fallacy to view the conventionally designed Fourdrinier as the last word.

It is a fallacy to think that only a few days' service is a fair span of wire life.

Today far more efficient headboxes are available—with Hydronamic Inlets an integrated feature.

Today an improved suction box design is available and it is easier on the wire.

Non-corrosive save-all trays and rails lighter and cleaner.

Engineered design makes all moving parts readily accessible for ease of cleaning and replacing wire.

In Fourdriniers of Black-Clawson design these and several other important steps forward have been taken and we would like to go over the drawings with you.

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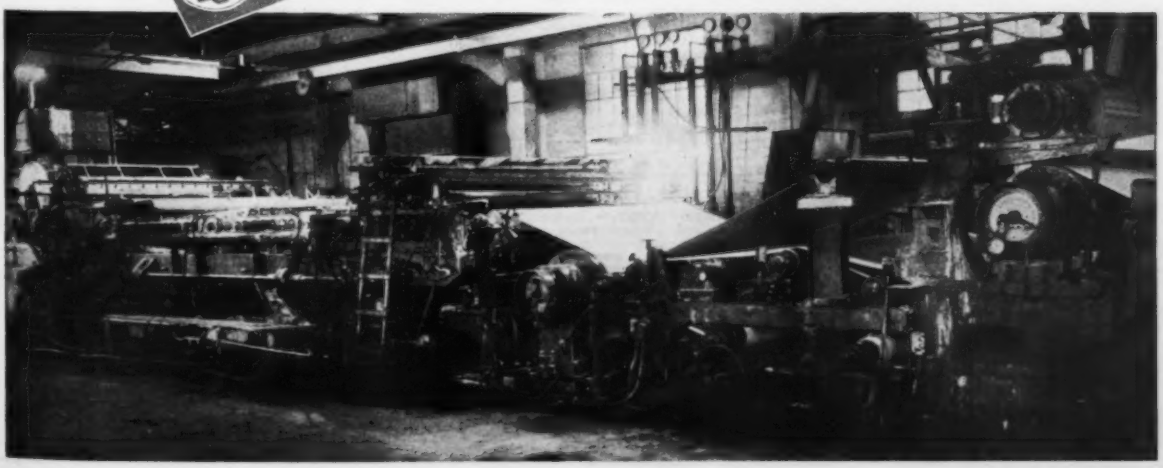

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FOR SALE

62" Beloit Cut-Off Knife for Paster or Corrugator with Slitters
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Write for Bulletins listing over 70 PAPER BOX and CONVERTING MACHINES now available.

SOUTH WABASH ENGINEERING CO.
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FOR SALE—4-SOS Bag Machines 1#, 2#, 3# and 10#. Good condition. Address Fabricon Products Inc., 1721 Pleasant Avenue, River Rouge, 18. Michigan. J-16

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Five—56" x 60" Dilts Improved Hollander Type Beating Engines with Keyed Type Bandless Rolls. These are both right and left hand.
Two—Niagara Horizontal Belt Driven Beating Engines. Extra Heavy Pattern. 66" dia. x 60" face rolls with four cast iron heads, keyed to spindle, equipped with bandless rolls.
Two—6 ft. x 12 ft. Rod Mills with Liners.
This equipment is now in use but will be available January 15, 1946.

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FOR SALE

1—108" Warren 2 drum winder
1—Shower pressure pump (Belt driven)
2—Calender rolls 12" dia. 88" face, 5" journals
2—Rubber covered press rolls 18" diameter 80½" face 7" journals (1" of rubber)
1—Steam engine indicator (Thompson)
6—M. & W. expansion winder shafts
2—75 HP. Slip ring motors 3 ph. 60 cyc. 440 volts 600 rpm. with grids and rheostats.
1—Voith pulper

FRANK P. LYDEN
Ft. Edward, N. Y.
B-31

FOR SALE

1—Sandusky Suction Couch Roll—30" diameter x 197" drilled face—with practically new Beloit Suction Shell.

BEATERS
1—2000 lb. Holyoke-Iron Tub Beater.
2—1200 lb. E. D. Jones (no tubs).
1—1000 lb. Dayton Beater (no tub).
1—400 lb. Gavit—iron tub beater.
1—Dilts Breaker Beater—Bandless Roll 62" diameter x 54" face—70 tons daily capacity. Equipped with Shartle Bros. Ragger.

BLOWERS
2—Buffalo Forge Company—Size 7—Duplex Conoidal steel plate Blowers. Ball bearing.

CALENDER STACKS
1—5 roll—72" face.
1—7-roll 36" Holyoke Machine (supercalender).
1—2 roll 24" laboratory calender stack.

CENTRAP
1—Shartle Brothers Centrap.

COATING MACHINE
1—26" six roll coating machine.

CREPING MACHINE
1—86" Waldron Creping Machine, practically new. Could be used for laminating.

CYLINDER MOULDS
1—30" diameter x 74" face.
2—30" diameter x 54" face.
1—30" diameter x 75" face.
2—36" diameter x 84" face.
1—36" diameter x 80" face.
2—36" diameter x 72" face.
5—30" diameter x 72" face.

DOCTORS
14—Dillon Doctors — complete with accessories—98" face.

DRIVES
1—40 h.p. Bagley & Sewall, enclosed drive.
2—30 h.p. Downingtown, enclosed drives, ratio 6 to 1.
1—Cleveland Worm Drive, Ratio 10 to 1. New.
4—Smith & Winchester mortise gear Drives.
1—Moore & White mortise gear drive.
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM.
2—#3 Reeves Drive.
1—#6 Reeves Drive.

DRYERS
1—28" diameter x 76" face.
1—48" diameter x 94" face.
2—36" diameter x 64" face, with frames gears and bearings.
2—25" x 120" (Baby Dryers).
1—48" x 100".
1—36" diameter x 38" face.
1—24 x 74 (Stainless steel).
3—24 x 72 (Copper face, textile type).

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
1—4 plate Flat Screen.
2—10 plate Flat Screens.

HYDRAULIC PRESSES
1—Lake Erie Engineering Co., 78 tons, platen 12" x 12".
1—Watson Stillman, 60 tons, platen 14" x 14", with triplex pump and motor.

JORDANS
1—#2 Emerson, with 125 h.p. motor.
2—Noble & Wood, Pony Monarch, Belt Driven.
1—No. 9 Emerson Jordan—for direct connection to a motor.
1—Noble and Wood, Monarch, new fillings.

LIGHTER BAR LIFTS
3 sets Hydraulic Lighter Bar Lifts, with pump.

PULLEYS
Various cone and assorted pulleys.

PULP EQUIPMENT
1—32" three pocket Glens Falls Grinder (for 27" wood).

PULP SCREEN
1—IMPCO centrifugal pulp screen design No. 3.

PULPER
1—Jones Pulper.

PULVERIZER
1—Erie coal pulverizer.

PUMPS
1—Buffalo Pump—5500 g.p.m. direct connected to 100 H.P. Motor (50' head).
4—Vertical Schutte & Koerting Acid Pumps (with motors).
2—Goulds—2 stage—420 g.p.m.—1010' head.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 drum reel 122".
1—72" Downingtown Expansion Reel.
1—2 Bowl Reel—110" face.

ROLLS
500—Brass tube-steel tube—rubber covered iron rolls—various sizes.

ROTARY SCREENS
3—Moore & White Rotary Screens (alternating diaphragm type).

ROTARY SCREEN
1—#2 Bird Screen (copper vat).

SAVEALL
1—Saveall 36" diameter x 96" face cylinder mold. (With iron end vat).

SCREEN PLATES
20 Plates cut .016.
10 Plates cut .008.
Also other sizes and cuts in stock.

SHEETERS
1—51" Hamblet Sheeter, layboy and roll backstand.
1—128" Moore & White Sheeter with layboy.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)
1—64" Hamblet Sheeter, layboy and 10 roll backstand.
1—10 roll back stand.

SHREDDERS
1—No. 25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder.
1—Waterville Shredder.

SLICE
1—132" Beloit Slice.

SLITTERS AND WINDERS
1—36" Beck Razor Blade type Slitter & Winder.
1—60" Moore & White Slitter and Winder set for ¼" slits.
1—60" Moore & White Slitter and Winder set for 7/16" slits.

STOCK PUMPS
1—10 x 12 open impeller. (All lead).
1—10 x 20 Shartle Brothers Triplex.
Numerous other Centrifugal Stock Pumps. Advise as to your requirements.

SUCTION FELT ROLL
1—Nash 110" Suction Felt Roll.

TOILET AND TOWEL MACHINES
1—65" Towel Machine.
1—85" Toilet Machine.

TRIMMER
1—50" Seybold Trimmer.

VACUUM PUMPS
1—No. 7 Sturtevant Vacuum Pump.
2—14 x 20 Connersville.
1—18 x 28 Sandusky.

WET MACHINES
1—84" Wet Machine.
1—74" Moore & White.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?
Wanted Cylinder and Fourdrinier Machines (complete mills).

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PAPER MAKING EQUIPMENT

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PAPER AND PULP MACHINERY

A Merry Christmas and a Happy New Year.

JACK ROSS, President.

1—Pusey & Jones 160" four cylinder Board Machine. 69 dryers stacked. 29-5' diameter—40-4' diameter. Enclosed electric drives, calender stack, etc. For immediate delivery.

AIR HOISTS
2—Two-Ton Ingersoll Rand
2—Five-Ton Ingersoll Rand

BEATERS
2—1800 lb. Horne Iron Tub.
3—1200 lb. E. D. Jones Iron Tub Beaters with washers.
2—1200 lb. E. D. Jones Beater—no tubs.
5—Valley Iron 750 lbs. Iron Tub Beaters, with Silent Link Belt Drive.
1—1200 lb. Noble and Wood—no tub. Spare new fillings for roll.
3—Valley Iron—Roll 67" diameter x 60" face—wood tub.

BIRD SCREEN PLATE
17 Plate—60 cut. New condition.

BLEACHERS
3—Fletcher high density bleachers—used 8 months.

BLOWERS
1—American ball bearing blower, size 17" x 29" for motor drive.

CALENDER DOCTORS
1 set of 16 Warren Doctors 104" face with frames.
90 Warren Doctors—various sizes.

CALENDER ROLLS
38 rolls various sizes

CALENDER STACKS
1—2 roll Holyoke 36" face.
1—Pusey & Jones 9 roll 64" face.
1—7 roll Beloit 72" face.
1—5 roll Moore & White 82" face.

CONTINUOUS TRAVEL CUT-OFF
1—Langston 74" r.h. Type S. Continuous Travel Cutoff, with change gear box.

CONVERTING EQUIPMENT
2—Sanitary Napkin Machines. With motors and starters.
1—Bliss Double Head Slitter.
2—Cameron Type 72" Towel Converting Machines.

COUCH ROLLS
2—18" diameter x 92" face—brass covered.
5—20" diameter x 92" face—brass covered.
1—72" face x 30" diameter.
1—76" face x 30" diameter.

CYLINDER MOLDS
2—110" face x 38" dia.

DANDY ROLLS
1—122" face 10" dia.
1—138" face 12" dia.
1—129" face 9½" dia.

DRYER DOCTORS
40—Warren Doctors. Various sizes.

DRYERS
2—24" Dia. x 48" Face.
13—120" face x 48" diameter—New
1—100" face x 48" diameter—with ball bearing.
8—52" face x 27" diameter.
1—24" diameter x 72" face.
4—72" face x 28" diameter with gears, springs and bearings.
5—74" face x 36" diameter with gears, springs and bearings.
5—74" face x 40" diameter with gears, springs and bearings.

FLAT SCREENS
3—Harmon 16 plate.
1—Sandy Hill 2 plate flat screen.
1—8 plate Packer—Roller shoes.
2—12 plate Bagley & Sewall Flat Screens with scrapers and spare set of plates.

FOURDRINIER SHAKES
1—Beloit Fourdrinier Shakes.
1—Sandy Hill Bertram Shake. Late type.

FOURDRINIER WET END
1—120" Beloit Fourdrinier Wet End.
1—74" Pusey & Jones Wet End.

HAMMERMILLS
1—American Hammermill—37" anti friction bearing equipped.
1—Williams 18" Hammermill Ball Bearing.

HOG
1—Mitts & Merrill Hog. 12" x 12".

JORDANS
1—E. D. Jones Imperial Jordans—belt driven.
1—E. D. Jones Imperial Jordan with 200 h.p. —360 r.p.m. motor.
1—Jones Standard, for motor drive.

KNIFE GRINDER
1—62" Bridgeport Knife Grinder.

KNOTTERS
1—Wells Knotter.
2—Trimbey Knotters.

LATHE—Motor Driven
1—Pond 38" Swing, 42' long. Screw cutting power cross feed. Face plate jaw holders 3 steady rests. Motor 10 h.p. with starter—3 phase—60 cycle—220 volts.

LINE SHAFT
1—Complete line shaft with pulleys and pillar block. 4-15/16" diameter.

MOTORS
1—Westinghouse 40 h.p. 900 r.p.m.—3 phase—60 cycle—440 volts—with starter.
1—Fairbanks Morse Induction 150 h.p.—900 r.p.m.—3 phase—60 cycle—440 volts—with starter.
1—G.E. 5 h.p. 1800 r.p.m.—3 phase—60 cycle—220 volts—with starter.
1—G.E. 75 h.p. 450 r.p.m.—3 phase—60 cycle—440 volts—with starter.
1—G.E. 100 h.p. 450 r.p.m.—3 phase—60 cycle—440 volts—with starter.
1—G.E. 50 h.p. 450 r.p.m.—3 phase—60 cycle—440 volts—with starter.
1—200 h.p. 285 r.p.m.—440 volts—3 phase—60 cycle.
1—500 Ampere Westinghouse Generator. New.

PLATERS
2—Holyoke 2 Roll 18" dia. 38" face.

PULLEYS
60—Cone Split and Solid Cast Iron Pulleys. Various Sizes.

PULP EQUIPMENT
1—126" face Kamyr Press.
1—84" Sumner Disc Barker with motor.
1—84" Carthage 4 knife chipper, 3 sets spare knives with one Waterville Hachipper.
2—IMPCO Pulp Screens
2—Trimbey Knotters
2—Apmew Pulp Screens
2—Trimbey Screens

PULPERS
1—Voith Pulper 20 tons cap.
1—Bird Pulper.

PUMPS
2—Ingersoll Rand 250 g.p.m. 1740 rpm 90' head —4" suction—3" discharge. Direct connected to 10 hp. General Electric 220-440 volt—3 phase—60 cycle motor.
4—Worthington Pumps 10,000 g.p.m.—55' head. Requires 75 h.p. at 350 r.p.m.
1—DeLaval 6" x 6".
6—Warren Vertical Pumps. 6" suction. 3" discharge. 138 g.p.m. 80' head. Direct Connected 6 h.p. General Electric motor. 1750 r.p.m. 440 volts, 3 ph.-60 cycle, ball bearing.
1—Worthington 3". 2 stage, 200 g.p.m. 224' head. Bronze Ball Bearings.
1—Worthington 400 g.p.m. 35' head 1750 r.p.m. Ball bearing.
1—Gould Figure 3000—size 8-4" suction—3" discharge.
1—American Marsh 200 g.p.m.—58' head—3" suction 2½" discharge.
1—Pennsylvania 1000 g.p.m. 80' head—6" suction—4" discharge—Connected to 30 h.p. G.E.—220 v. 3 phase—60 cycle motor.
8—De Laval Verticals—540 g.p.m. 1740 r.p.m. —30' head 5" x 5". Direct connected to 7½ h.p. Allis Chalmers Motor. 440 volts—3 phase—60 cycle.
1—6" Pusey & Jones Open Impeller Centrifugal Stock Pump—belt driven.
1—7" Pusey & Jones Open Impeller Centrifugal Stock Pump—belt driven.
1—Worthington 730 g.p.m. 120' head.
3—3" Lanse Size Pumps—belt driven.
1—La Courtney 4 stage, 1000 g.p.m., 1750 r.p.m., 750' head. With base and couplings for motor.
1—La Courtney 6 stage 1200 g.p.m., 1760 r.p.m., 1100' head, with base and couplings for motor.
10—Water Pumping Units, 500 g.p.m., 270' head, 2400 r.p.m. Driven by a Chrysler Crown Gasoline Engine and mounted on a two wheel trailer.
1—Terry Marsh 730 g.p.m., 250' head. Requires 125 h.p. motor.
2—Ingersoll Rand all bronze 175 g.p.m.—40' head.
1—Worthington 3"—200 g.p.m.—3550 r.p.m.—488' head.

REFINERS
1—Weiner Refiner 24" with extended base for direct connection to motor.

ROLLS
40—Table, Dress, Felt, Wire, Breast and Cascader Rolls. Various Sizes.

ROTARY SCREENS
2—#2 Bird with copper vats.
2—#1 Bird with steel vats, lead lined.
1—Moore & White.

RUBBER PRESS ROLLS
1—120" Face—19" Diameter.
1—119" face x 19½" diameter.
1—118" face x 18" diameter.
1—100" face x 18" diameter.

SCREW PRESS
1—Valley Iron Screw Press. Used 2 years.

SHEETERS
1—96" Hamblet Duplex.
1—136" Hamblet Duplex.

SHREDDERS
2—24" Sprout Waldron heavy duty shredders—anti friction bearing equipped.
1—Taylor Stiles Portable Pulp Shredder—on wheels.
1—Ryther and Pringle Shredder.
3—36" Mitts & Merrill with 125 h.p. motors and starters

SLITTERS AND WINDERS
1—61" Waldron Slitter and rewinder. Roll unbossing attachment.
1—Moore & White 4 drum 115" face.

STEAM LOCOMOTIVES & WOODLAND EQUIPMENT
1—32 ton 36" gauge Shay-Lima locomotive. Air pressure 150 lbs. P.S.I. with a large lot of new spare parts.
1—40 ton 36" gauge Improved Climax Locomotive. Boiler pressure 150 lbs. P.S.I. with a large lot of new spare parts.
30—36" gauge wood cars. 40,000 lbs. log or pulpwood capacity. Used 4 months.
1—Sheffield motor car, manufactured by Fairbanks Morse—36" gauge—New.

STONITE PRESS ROLL
1—Stowe Woodward 111" face x 22" diameter.

SUPERCALENDER STACKS
1—7 roll Norwood—52" face.

TRIMMER
1—38" Undercut Trimmer.

TURBINES
1—Westinghouse 125 h.p. 125 steam pressure—15 back pressure. Complete. Used 1 year.

VACUUM PUMPS
2—14" x 20" Connersville.

VOITH INLET
1—112" Voith High pressure stock inlet, equipped with lump breaker roll.

WET MACHINE
1—84" Wet Machine—cylinder mould 40" diameter with 16" diameter rubber couch.

YANKEE DRYERS
2—Beloit 8' dia. x 175" face—75# working pressure.
1—Beloit 5' dia. x 194" face—75# working pressure.

FOR SALE

FRANK H. DAVIS CO.,

ESTABLISHED 1889

USED AND REBUILT PAPER MACHINERY.

FOR SALE

BEATERS
2—Holyoke 66 x 60 iron tub
1—Holyoke 48 x 44 iron tub
1—Horne patent beater 50 x 90, bronze bars
1—2000 lb. Horne iron tub new 1941, bandless roll 60 x 48

CALENDERS
1—52" Textile seven roll supercalender
1—43" Holyoke seven roll supercalender
8—Paper rolls 76 x 15¾ Jour. 7¾ x 13¾"

CUTTERS
1—110" Hamblet duplex sheet cutter
1—84" Clark with Moore & White layboy
1—Taylor Stiles rag cutter
2—No. 2 Daniels rag cutters
1—63" Smith & Winchester undercut ream cutter
1—115" Single knife Moore & White cutter and slitter, also layboy

DECKERS
1—30 x 95" Black & Clawson
1—30 x 74" Impco
3—Apmew filters, mould 50 x 100"

DRIVES
6—Beloit 14 & 63 tooth 7" face C O mortise gears

DRYERS
1—8 ft. x 86"
2—8 ft. x 175"
1—8 ft. x 102"
1—6 ft. x 194" new 1939
1—6 ft. x 106"

DUSTERS
1—four cyl. R.R.
1—Devil

FANS
Two—Buffalo double turbo 6½ conoidal forced draft fans

ENGINES
1—Hamilton Corliss 10 x 30 direct connected to 30 KW Westinghouse engine generator including exciter, balance wheel 10 ft. x 11"
1—10 x 10 American Ball twin variable speed, 100 HP excellent condition

FOURDRINIER PARTS
1—119" x 54' 10" wire Rice Barton anti friction equipped 16" breast and 18" suction couch, now running
1—120" x 75 ft. wire Horne new 1927, anti friction equipped 25" suction couch and Beilit oscillating suction boxes. Also two sets Horne heavy presses with 20" dia. rolls. Now running 450 FPM
1—132" x 61' 2" wire Pusey & Jones, plain couches, running at 500 FPM
1—100" x 31 ft. special with two Reeves drives
1—72" Sandy Hill
1—120" Voith Inlet
2—Sets 10" slices

FILTERS OR DE-INKERS
1—Apmew three cylinder, mould 50 x 100", worm gear drive

MIXERS AND COOKERS
1—25 gallon cooker, No. 75

PULPERS
1—No. 1 Lanneye
2—Jones with Falk reducers and motors 440 volts 3 ph sixty cycle

PUMPS
1—10 x 10 Beilit triplex
2—10 x 12 Deane rebuilt
1—Ingersoll Rand Pump, type Imperial 10

REELS
1—Two bowl Beloit, drums steel 18 x 123, slip belt drive

SCREENS
2—No. 2A Bird
2—No. 2 Bird
1—Moore & White No. 3
1—Jones Laith Walk
2—12 plate Packer
4—New 10 plate Witham vats

SHREDDERS
2—Mitts Merrill No. 15 CF direct cent. to 125 HP 440 volt motor
1—Carthage Mitts Merrill type 14A F E S No. C 19028

SORTING TABLE
1—Moore & White sorting table

SLITTERS AND WINDERS
1—120" Moore & White four drum
1—120" Kidder two drum
1—114" Moore & White winds 60" roll
1—84" Bagley & Sewall
1—56" Cannard
1—26" Kidder two drum
1—24" Langston

WASHERS
2—2000 lb. Union Machine steel tub Apmew three cylinder

WET MACHINES
1—84" Noble & Wood, automatic cut off Bottom roll H.C. 24 x 82"

Builders of

ASPHALT COATING, COMBINING MACHINE, GUMMING AND CREPING MACHINE, ROLL GRINDER

FRANK H. DAVIS COMPANY
175 Richdale Ave., Cambridge, Mass. TF

FOR SALE

FOR SALE

FOR SALE

1—Fourdrinier Machine
Wire 50' x 81'
Two presses
18 dryers—1 Lead dryer and 2 felt dryers
1 calender stack
1 rewinder
Drives all enclosed type. Complete with line shaft and some accessory equipment.

1—3-cylinder 74" trim board machine.

Above machines now in operation.

SHARTLE BROS. MACHINE CO.

Middletown, Ohio

J-2

FOR SALE

400 HP Harris-Corliss Steam Engine in good condition.
Philadelphia Speed Reducer, 125 HP, Ratio 1—2/3 to 1, 300 RPM.
2—Gould Centrifugal Pumps, Size 3, 250 GPM, 82 ft. Head, RPM 1150.
3—37½ KVA Transformers, GE, 2200/4400 to 244/488/608 Volts, 60 Cycle, All Rewound in 1946.
1—15 KVA Transformer, GE, 2200/4400 to 110/220 Volts, 50/60 Cycle.
1—3 KVA Transformer, GE, 600 to 120/240 Volts, 50/60 Cycle.
Over 100 Steel Split Pullies, all sizes.

GOLDEN FLEECE CO., INC.
Bancroft, Mass. TF

FOR SALE

Bagley & Sewall 2 drum improved winder Bronze bearings, 2 split rewinding shafts was in front of machine running 600 feet per minute making specialties. Good condition. Trims 185 inches. Address Box 46-838 care Paper Trade Journal. D-26

FOR SALE

2—Brownell Twin High Pressure Engines — 250 h.p. each — 260 r.p.m.—size 14 x 16".

1—Hamilton Corliss Engine—200 at 120 r.p.m. size 18 x 36".

1—Fulton Iron Works Corliss Engine—200 h.p. at 100 r.p.m. size 14 x 42 engines.

J. J. ROSS COMPANY
250 Frelinghuysen Ave. · Newark 5, N. J.
Tel. Bigelow 3-3720 D-26

FOR SALE—One Paper Converting Embossed Quarterfold Napkin Machine. High speed. Perfect condition. Address Box 46-859 care Paper Trade Journal. J-2

1—Modern Clipper Cellophane Bag Machine.
1—92" Dillon Duplex Rotary Sheet Cutter with slitting attachment, Brannan Ream Folder and 25 roll backstands.
6—Potdevin and
1—Lockport flat and square bag machines, complete with motor equipments making bags from ¼ to 25 pounds.
1—Noble & Wood Pony Jordan with extra new filled plug. ⅛" steel fillings.
3—Lockport Flat and Square Bag Machines making bags from 4 to 24 lbs., also SOS Bag Machines making 1, 2, 3, 7, 8 & 10 lb. bags.
1—42" 3 roll Friction Calender, two steel rolls, one cotton roll.
1—72" Hamblet Sheeter complete with motor drive and 8 roll backstand.
1—105" Warren Drum Winder.
2—Dietz Facial Tissue Toilet Perforators. One 81" wide—4½ x 5" sheets. One 92" wide 4¼ x 4½" sheets. Excellent condition.
1—64" Waldron Brush Coater. Festoon equipment. New J. O. Ross Drying Oven. 5 Buffalo Blowers. New winding reel. Motor equipments.
1—Sheridan Die Press 27x44"—rebuilt.
1—12" wide Partition Machinery Co.'s automatic wax paper, cutter box roll machine.
4—Complete spiral tube winders with automatic cut-offs, also recutters. 2 Langston and 2 Knowlton manufacture.
6—Rotary Embossing Machines: 1—33", 4—34" and 1—44".

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y. TF

FOR SALE

New brass covered felt or wire rolls 84" dia., 84 to 120" face. These are made from government surplus and are new in all respects.

Osborne Paper Mill Equipment Co.
Fulton, N. Y. TF

FOR SALE

1—86" Waldron Creping Machine Practically new. Could be used for laminating.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Tel. Bigelow 3-3720 D-26

FOR SALE

REVAMPING AND REBUILDING MILL AND CAN OFFER FOR SALE

Garrick Combustion controls for two boilers to be sold as unit.
1—Noble & Wood Mammoth Jr. Jordan ¼" Filling.
1—Brass covered finishing press roll 17¾" dia. x 80½" face complete with bearings and Noble & Wood friction drive.
1—4000# capacity motor driven freight elevator with automatic stop control—can be inspected in operation at our plant.
2—8" Barnes centrifugal sewage pumps.
10—100" screen plates for No. 2-A Bird Screen. Slots .022—never used after being recut once.
1—Brass covered press roll 11½" dia. x 68" face—journals 4-13/16" dia. x 7½" long.
1—Rubber covered press roll 13" dia. x 86¼" face—journals 4-15/16" dia. x 10½" long.
11—20" face cast iron tapered pulley—2-15/16" bore, taper 31"-29½"
2—20" face cast iron tapered pulleys—3-7/16" bore, taper 31"-30"
1—20" face cast iron tapered pulley—3-15/16" bore, taper 30"-28½"
1—24" face cast iron tapered pulley—3-7/16" bore, taper 31⅝"-29¾"
2—Steel split pulleys 60" dia. x 31" face x 5-15/16" bore.
3—Steel split pulleys 60" dia. x 41" face x 5-15/16" bore.
1—Cast iron split pulley 60" dia. x 21" face x 3½" bore.
1—Cast iron split pulley 40½" dia. x 21" face x 3½" bore.
1—Cast iron split pulley 84" dia. x 36" face x 5-15/16" bore.
1—Cast iron split pulley 72" dia. x 16" face x 8⅝" bore.
1—Paper pulley 24" dia. x 21" face x 4½" bore.
1—8½" dia. x 85" face rubber covered squeeze or wringer roll—Journals 1-15/16" dia.
1—8" dia. x 88" face calender roll—8" dia. journals.
12—6½" dia. x 82" face steel drier felt rolls with 1-7/16" x 8½" journals.
3—Pair Noble & Wood lighter stands complete with lighter beams and bearings for 8" dia. journal beater roll.
1—Rubber covered roll 17¾" dia. x 89" face, journals 4½" dia. x 9" long with Noble & Wood friction drive.

A visit to the mill would prove profitable as we have many items for sale too numerous to mention. See our superintendent, Mr. O. P. Fussell at our plant in Walloomsac, N. Y.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, N. Y.
TF

FOR SALE

5—Dryers 40" Diameter x 74" face, with gears, bearings and frame
5—Dryers 30" Diameter x 74" face, with gears, bearings and frame
1—Cylinder Mold 30" Diameter x 72" face
1—Cylinder Mold 30" Diameter x 76" face
1—Split Pulley 76" Diameter x 14" face
1—Split Pulley 74" Diameter x 12" face
1—Split Pulley 60" Diameter x 12" face
1—Split Pulley 36" Diameter x 10" face
1—Split Pulley 32" diameter x 12" face
1—Split Pulley 28" Diameter x 12" face
20—Pulleys, smaller sizes
1—Calender Stack—9 rolls, 72" face, dustars and drive
2—Hoffman couch rolls, 76" face
1—Four Drum Moore & White Winder, 72" face
1—Slitter Stand, 68", with above
1—Cast Iron End Cylinder Vat for Mold 36" Diameter x 84" face
1—Westinghouse Motor 440 V. 40 HP. 3 Phase 900 RPM.
1—Fairbanks-Morse Induction Motor 440 V. 150 HP. 3 Phase 600 RPM with G.E. starter
1—Langston 74" R.M. Type "J" continuous travel Cut Off (with change gear box)
Address Box 46-900 care Paper Trade Journal
TF

FOR SALE

1—Triple Effect Zaremba Evaporator, 84" dia., each effect 1200 square feet of heating surface, 440-1" steel tubes, 2 tilt traps, 2 moisture separators, inter-connecting piping and barometric condenser, traps and 3 liquid level controllers. Vacuum pumps are not included. Available for immediate shipment. May be inspected at any time. Address Box 46-903 care Paper Trade Journal. J-2

FOR SALE

FOR SALE

1—Noble & Wood Mammoth Junior Jordan 3/16"—Carbon Steel Bars—with coupling for motor listed below.
1—G.E., TS-16, 200 HP Motor, 400 RPM, 2200 V, 3 Phase, 60 Cycle, Dripproof, Direct Connected Exciter, 0.8 P.F., 40° C, Synchronous, Enclosed Collector Rings. This motor has a coupling half for connection to the Mammoth Junior Jordan listed above.
1—G.E., CR-7073-Y1 Starter for above motor, 2200 V, 3 Phase, 60 Cycle with rheostat.

All of the above equipment is brand new. Subject to prior sale. Please address replies to the Paper Trade Journal. Box 46-891. J-2

FOR SALE
DILTS BREAKER BEATER
Bandless Roll 62" diameter x 54" face—70 tons daily capacity.
Equipped with Shartle Bros. Ragger.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Tel. Bigelow 3-3720 D-19

FOR SALE

1—102" Waldron 7-brush Coater.
1— 70" Waldron 5-brush Coater.
Box No. 46-899 care Paper Trade Journal. D-26

PAPER MILL EQUIPMENT FOR SALE

110" Hamblet heavy duty Sheeters.
72" model 46-W Cameron Rewinder.
94" Inman shear cut Slitter.
Kidder Rotary Press, 4 colors one side, two on reverse, 34" cut.
54" Brown & Carver hand clamp Power Cutter.
14 x 22 John Thomsen.
38" Burton heavy duty Rotary Perforator.
American heavy duty Cross-Cut Saw.
Baling Presses—NEW—Both hand & power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York (18)
TF

FOR SALE — Complete Poirier Suction Box Vacuum Control System, practically new. Address Box 46-840 care Paper Trade Journal. D-26

FOR SALE—29 No. 14 Pusey & Jones Steam Joints. Immediate delivery. Address Box 46-884 care Paper Trade Journal. D-26

PAPER COATING MACHINERY — Waxing, Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

FOR SALE—One 81" Toilet Winder 4½ x 4½ Perforation. Fully automatic. Address Box 46-868 care Paper Trade Journal. J-2

FOR SALE—Cellophane. Available in small cut size sheets, either moistureproof or plain. Fairly prompt delivery. Address Box 46-883 care Paper Trade Journal. TF

FOR SALE—One 38" two color Rotogravure Press. Sheet feed and pile delivery. Practically new. Address Box 46-841 care Paper Trade Journal. TF

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore 30, Md. TF

FOR SALE—40" Seybold Cutter, guaranteed to be in excellent operating condition. Address Box 46-904 care Paper Trade Journal. D-26

FOR SALE

FOR SALE—5 Ton DC Shepard-Niles Crane and Hoist Complete with motors, 220 volts; also 60' Mono-Rail, including two drum controls. Immediate delivery. State best price. York Paper Mfg. Co., P. O. Box 189, York, Pa. J-16

FOR SALE—2 new brass Fourdrinier wires 154" x 65', 75 mesh, plain weave. CELLULOSE ENGINEERS, Inc., 71 Columbia Street, Seattle, 4, Washington. J-2

WANTED

WANTED

Kraft Paper
Wrapping Paper
Tissue Paper
Specialty Paper

full machine time guaranteed.

Carload quantities—continuous flow of orders—well rated financially

Box No. 46-896 care Paper Trade Journal. D-26

WANTED

Slitting and Roll Winding Machine for board—working width approximately 48"—diameter of rewound rolls approximately 24" (ten rolls, each about 4½" wide). Sheeter with Layboy for Duplex cutting with trim as large as possible—between 90 and 104 inches.

Reply to 6804 Empire State Bldg., New York City. D-26

WANTED TO PURCHASE

"One complete mill for making white patent coated, newsboard, cover paper, complete with three formers or cylinders. Trim about 72 inches, capacity about eight tons daily. Wanted for export. J. M. Rios & Co., 11 Broadway, N. Y. 4." TF

WANTED

14 or 16 plate Flat Screen.

Two bowl reel to wind rolls that will rewind to 75" dia. 112" trim.

Langston or Cameron Rewinder to wind rolls up to 75" diameter 112" trim.

Address Box 46-905
care Paper Trade Journal
J-2

WANTED—Used Triplex Stock Pump, size approximately 8 x 18. One Dilts Bandless Beater Roll or Dilts Bandless Beater complete. Prefer approximately 48 x 60. One No. 6 Nash Vacuum Pump. OHIO PAPER COMPANY, Miamisburg, Ohio. J-2

WANTED

WANTED

Side rolls odd lots of any kind of paper in rolls 12½" and wider any color, preferably white, also printed with any design. All grades.

Contact

GEORGE S. BLEYER
BLEYCO PAPER CORP.
214 Sullivan St., New York #12

D-26

WANTED

Sources of any chemicals for Paper Producers by interested party having several years personal contact with paper mill managers, superintendents and technical men. Desire contact with suppliers who are looking for increased sales volume through new accounts in territories in the East, South and Middle-West. Advertiser has several years of background in production of pulp and paper as well as several years experience providing technical service on paper chemicals to the Industry. Address Box 46-875 care Paper Trade Journal. J-2

WANTED — PAPER

50" to 72" jumbo mill rolls, or will trim machine, bleached or unbleached *sulphite* or bleached or unbleached *kraft* in weights 15# to 22# (24x36-500). Can use several cars monthly. Address Box 46-864 care of Paper Trade Journal.

D-26

PAPER MANUFACTURER desires to purchase or invest in converting business of standard paper products. Address Box 46-708 care Paper Trade Journal. TF

WANTED — W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 46-32 care Paper Trade Journal. TF

WANTED—SEYBOLD CUTTERS with capacity of 44" or over, CAMERON ELECTRIC EYE SPOOLERS Model No. 24 or Model No. 2D, and KRAUSE DIE CUTTERS. Write or wire Reynolds Metals Co., Engineering Division, Richmond, Virginia. J-9

BAG MACHINES WANTED — 1 — 102 Potdevin; 1—104 Potdevin; 1—#5 Sac Machine; 1—Old Style Hat Bag Machine. Address Box 46-870 care Paper Trade Journal. TF

WANTED—Paper Board Machine, capable of producing 35 to 100 tons folding box board daily. Replies held in strictest confidence. Address Box 46-651 care Paper Trade Journal. TF

WANTED

WANTED—SEYBOLD CUTTERS with capacity of 44" or over, CAMERON ELECTRIC EYE SPOOLERS Model No. 24 or Model No. 2D, and KRAUSE DIE CUTTERS. Write or wire Reynolds Metals Co., Engineering Division, Richmond, Virginia. J-2

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED FOR EXPORT—Paper Mill Machinery including Dryers, Beaters, Screens, Calenders, Pumps, etc. Address Box 46-879 care Paper Trade Journal. J-9

PAPER TO TRADE—Have two carloads white paper in rolls basis weight 24 x 36—500—110# (approx.), caliper approximately .009". Want equal tonnage 60 to 66# white paper in rolls, or 150% Bleached Sulphite Pulp or 200% unbleached (Bleachable). Write Box 46-889 care Paper Trade Journal. D-26

WANTED—Rotary Boiler 7 ft. dia. x 20 ft. long. Address Box 46-893 care Paper Trade Journal. D-26

WANTED—New or used Paper Converting Machine suitable for single interfold sheet type toilet tissue 4½ x 6½. Address Box 46-895 care Paper Trade Journal. TF

WANTED—Brightwood Box Machine. Address Box 46-33 care Paper Trade Journal. TF

SALES REPRESENTATIVE

WILL EXCHANGE board for laminating, mounting, lining and die-cutting machinery. Address Box 46-707 care Paper Trade Journal. TF

SALES REPRESENTATIVE — Technically trained, covering Minnesota, Wisconsin and North and South Dakota, is looking for additional lines. Address Technical Supply Company, 517 Northwestern Bank Bldg., Minneapolis, Minnesota. J-16

MISCELLANEOUS

BENVENISTE & CESANA
ESTABLISHED 1923
ATHENS, GREECE
THISSEOS STREET No. 10

Telegrams: "BIENVENU" ATHENS. Large importers of Newsprint Paper are greatly interested also in *SIDE-RUNS* and invite offers from American manufacturers for any quantity and size that may be available. **D-26**

BLANKETS

Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

CLASSIFIED ADS BRING RESULTS

CLASSIFIED ADS BRING RESULTS

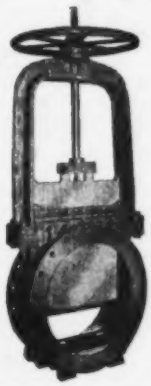
FOR YOUR EMBOSSING NEEDS USE...
NORTHERN ROLLS
Engraved by NORTHERN ENGRAVING AND MACHINE CO., *GREEN BAY, WIS.*

Appleton Wires are Good wires
APPLETON WIRE WORKS, INC. APPLETON, WIS.

MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

PULP MILL MACH'Y **FINISHING ROOM MACH'Y**
FRICTION CLUTCHES
The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

Appleton Felts MAKE GOOD PAPER
APPLETON WOOLEN MILLS
APPLETON, WISCONSIN



RECORD PAPER & PULP STOCK VALVES "BONNETLESS SELF CLEARING" - - - "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS."

RECORD FOUNDRY & MACHINE COMPANY

LIVERMORE FALLS, MAINE, U. S. A.

SCREENS of Perforated Metal

The Harrington & King Perforating Co.

5652 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

The Trade-Mark of

RELIABLE FELTS

The Waterbury Felt Co.

SKANEATELES FALLS, N. Y.

PENNOTEX OIL CORPORATION

29 Broadway
New York, N. Y.

AMORPHOUS WAXES

Melting Points 120° F. to 205° F.

For the Manufacture of

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Mill Cogs

ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

READY TO RUN

the moment driven and keyed. Write at once for circular "G" and instruction sheets free.

THE N. P. BOWSHER CO.
South Bend, Ind.
Established 1882

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CAMACHINE 18, a *fast* winding unit for shipping, bag, board and counter rolls, etc. Produces perfect rolls right off the end of the paper machine. Keeps well ahead of the fastest paper or board machine.

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Specializing, too, Lindsay has made Fourdrinier wire cloth ever since 1903.

A diamond splitter sometimes studies the structure of a "rock" for many months before he "taps" it. The making of diamond dies at Lindsay is a fine art, as is the drawing of Fourdrinier wire through those dies. The selection of the diamonds themselves; the accurate laying out of the approach angle and other phases; the actual drilling of the hole by electric spark, the wire-drawing that follows,—all operations much more painstaking than one imagines. All this is specialized procedure which goes far toward giving you Fourdrinier wires exactly as you must have them.

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14001-14299 Aspinwall Avenue • Cleveland 10, Ohio

Lindsay WIRES
FOR PAPER MILLS

~~HIGH SPEED~~

PAPER BAG MACHINERY

MANUFACTURED BY

WEBER

H. G. WEBER & COMPANY, INC.

KIEL, WISCONSIN

WHERE TO BUY

ABRASIVES
Monsanto Chemical Co.
Norton Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division

ADHESIVES
American Anode Incorporated
American Resinous Chemicals Corp.
Arabol Mfg. Co.
Casein Company of America
Flintkote Company
Kelco Company
Monsanto Chemical Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Biggs Boiler Works Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Hardinge Co., Inc.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

AIR CONDITIONING
Spray Engrg. Company
Steamaire Company

ATOMIZERS
Steamaire Company

BAG MACHINES
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BALING MACHINES
Thomas W. Hall Co.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
Holyoke Machine Company
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D., & Sons Co.
Magnus Metal Corp.
Montague Machine Works
Raybestos-Manhattan Inc.
Manhattan Rubber Division
Rollway Bearing Co.
Shartle Brothers Machine Co.
SKF Industries, Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Alexander Brothers
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machy. Corp.

BLEACHING BOILERS, ROTARY
The Biggs Boiler Works Co.

BLEACHING APPARATUS
The Biggs Boiler Works Co.
Improved Paper Machy. Co.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Roderick O'Donoghue
Pennsylvania Salt Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Carthage Machine Co.
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOILERS
Babcock & Wilcox Co.
Biggs Boiler Works
Foster Wheeler Corp.

BOILERS (Electric)
Steamaire Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Holyoke Machine Company
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Casein Company of America

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Grinnell Company
Hamblet Machine Co.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Eng. Co.
Shartle Brothers Machine Co.
Williams Apparatus Co.

CHEMICALS
American Anode, Incorporated
Amer. Cyanamid & Chem. Corp.
Amer. Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Calgon, Inc.
The Cowles Detergent Co.
Diamond Alkali Co.
Dispersion Process, Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Falls Chemical Products Co.
General Dyestuffs Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
Kelco Company
The Kinsley Chemical Company
Mallinckrodt Chemical Works
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.

WHERE TO BUY

Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Company
Philadelphia Quartz Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Adell Chemical Company
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
The Cowles Detergent Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department Hercules Powder Co.
Magnus Chemical Co.
Monsanto Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Hardinge Co., Inc.
Holyoke Machine Company
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Stearns Magnetic Mfg. Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Mayer Machine Co.
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corporation, John
Weber, Herman G.

COCKS, LUBRICATED PLUGS
American Car & Foundry Co.

COLORS
C. K. Williams & Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machy. Corp.

CONDENSERS
Foster Wheeler Corp.

CONSULTING ENGINEERS
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Alvin H. Johnson & Co., Inc.
The Kohler System Company
Main, Inc., Chas. T.
The MacPherson Company
Roderick O'Donoghue
The Rust Engrg. Co.
J. E. Sirrine & Co.
South Wabash Engrg. Co.
Stone & Webster Engrg. Corp.

CONTROLLERS
Black-Clawson Co.
Cochrane Corp.

CONTROLS
The Bristol Company
Cochrane Corp.
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.

COOKING PROCESSES
The Kinsley Chemical Company

COOLING SYSTEMS
Foster Wheeler Corp.
Steamaire Company

CORES
Hixmah Paper Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CRANES
Northwest Engrg. Co.
Reading Chain & Block Company

CRUSHERS
Fibre Making Processes, Inc.

CUTTERS
Dilts Machine Works
Thomas W. Hall Co.
Noble & Wood Machine Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Steamaire Company
Valley Iron Works Co.

DE-INKING
Adell Chemical Company
Dilts Machine Works
Hardinge Co., Inc.
Kinsley Chemical Co.
Roderick O'Donoghue
Shartle Brothers Machine Co.

DIGESTERS
Biggs Boiler Works Co.
Foster Wheeler Corp.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Lodding Engineering Corp.
Montague Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
Lodding Engrg. Corp.
Montague Machine Co.
Raybestos-Manhattan Inc. Manhattan Rubber Division
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DRUMS
Fibre Making Processes, Inc.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DUSTERS
Appleton Machine Co.

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Your plans for industrial expansion, for strategically located distribution centers, must be based on a complete, orderly array of facts. Half-way measures and assumptions won't do—you need the *whole* story.

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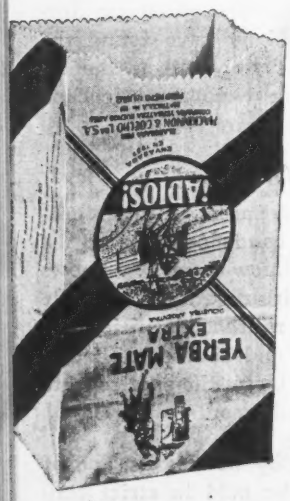
KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina



POTDEVIN

ANILINE PAINTING

SELF-OPENING SQUARE PAPER BAG MACHINES

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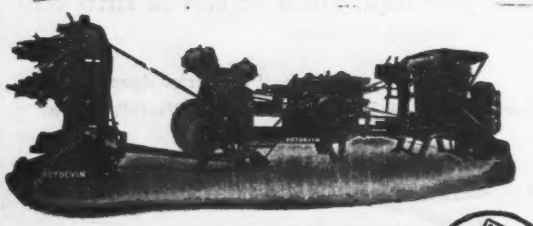
MULTI-COLOR PRINTED BAGS FROM THE ROLL IN ONE OPERATION



POTDEVIN MACHINE CO.
EST. 1893
1223 38TH ST BROOKLYN N.Y.
POTDEVIN

WHERE TO BUY

Downingtown Mfg. Co.
Fibre Making Processes, Inc.
Holyoke Machine Company
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EMBOSSING ROLLS
Northern Engraving & Mch. Co.
Roehlen Engraving Works

EVAPORATORS
Black-Clawson Company
Foster Wheeler Corp.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Fibre Making Processes, Inc.
Hardinge Co., Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co., Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.

FELT CONDITIONERS
Steamaire Company

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
Aluminum Flake Co.
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
Amer. Resinous Chemicals Corp.
Johns-Manville Sales Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Cochrane Corp.
Hardinge Co., Inc.
Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Worthington Pump & Machy. Corp.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Klemp Co., W. F.
Norton Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.

FRICTION MATERIALS
Johns-Manville Sales Corp.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Holyoke Machine Company
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Holyoke Machine Company
Lobdell Car Wheel Co.
Montague Machine Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Wks.

GRINDING WHEELS
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Norton Company
United States Rubber Co.

HEAT EXCHANGERS
Foster Wheeler Corp.
Stickle Steam Specialties Co.

HEAT RECOVERY SYSTEMS
Foster Wheeler Corp.
Stickle Steam Specialties Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Cochrane Corp.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthington Pump & Machy. Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Holyoke Machine Company
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.
Reading Chain & Block Corp.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

HUMIDITY CONTROL
Spray Engrg. Company
Steamaire Company

HYDRAPULPERS
Ross Paper Machy. Co.

INSTRUMENTS, TESTING AND MEASURING
Bauer Brothers Co.
N. P. Bowsher
The Bristol Company
Cochrane Corp.
The Foxboro Company
General Electric Company
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Wallace & Tiernan Instrument Co.
Williams Apparatus Co.

INSULATION
Johns-Manville Sales Corp.

JOINTS
Perfecting Service Company

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.

WHERE TO BUY

E. D. Jones & Sons Co.
Valley Iron Works Co.

KNOTTERS
Fibre Making Processes, Inc.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.
Williams Apparatus Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers Machine Co.

LINTER COTTON
The Railway Supply & Mfg. Co.

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MATERIAL HANDLING
Automatic Transportation Co.
Brooks Equipt. & Mfg. Co.
Northwest Engrg. Co.
Reading Chain & Block Company

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.
Steamaire Company

MOISTURE CONTENT CONTROL
Spray Engrg. Company
Steamaire Company
Stickle Steam Specialties Co.
Williams Apparatus Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Continental Electric Co.
De Laval Steam Turbine Co.
General Electric Company
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

NOZZLES
Spray Engrg. Company
Steamaire Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
Johns-Manville Sales Corp.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Bagley & Sewall Co.
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Wks.
Valley Iron Works Co.

PAPER MILL BUILDERS
Merritt-Chapman & Scott Corp.
The Rust Engrg. Co.

PAPER TUBE MACHINERY
Theo. Adams
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
South Wabash Engrg. Co.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corp., John

PENSTOCKS, WELDED STEEL
The Biggs Boiler Works Co.

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Deublin Company
Grinnell Company
Johns-Manville Sales Corp.
Stowe-Woodward, Inc.
Stowe-Wodward, Inc.
Taylor Forge & Pipe Works
Walworth Company

PLATERS
Perkins & Son, Inc., B. F.
Holyoke Machine Company

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLATE WORK (Steel & Alloy)
The Biggs Boiler Works Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSURE VESSELS, STEEL AND ALLOY
The Biggs Boiler Works Co.
Foster Wheeler Corp.

PRESSES
Black-Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Fibre Making Processes, Inc.
Thomas W. Hall Co.
Holyoke Machine Company
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Valley Iron Works Co.
Waldron Corp., John
Weber, Herman G.
Williams Apparatus Co.

PULPERS
Bauer Brothers Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
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Fig. 45 — Biggs 14 ft. dia. welded rotary digester with worm-and-segment drive.

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MODEL 28

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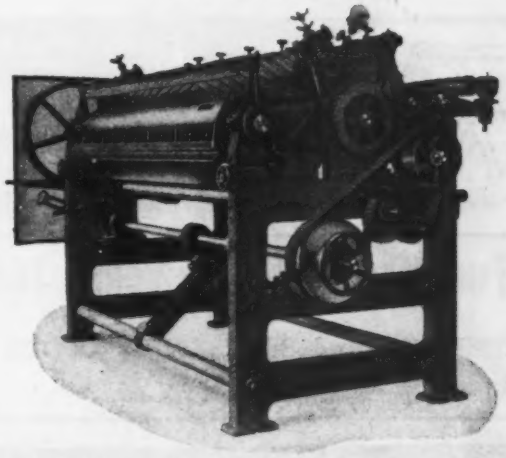

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Hendrick Manufacturing Co.
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J. J. Ross Company
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Texas Gulf Sulphur Co.
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Dorr Co.
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Montague Machine Co.
Moore & White Co.
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J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Rotogravure Engrg. Co.
J. J. Ross Company
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Shartle Brothers Machine Co.

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Crane Company
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Fibre Making Processes, Inc.
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Moore & White Co.
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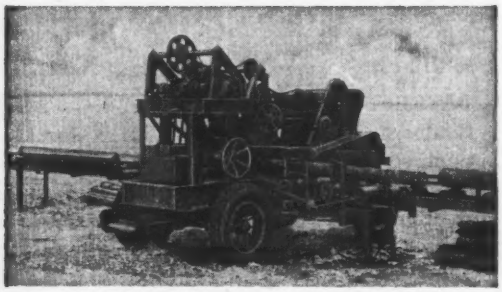

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